

CB

AN ARGUS SPECIALIST PUBLICATION

CITIZENS' BAND

**BEGINNERS'
LUCK**

**Newcomers'
guide
to CB**



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RF POLLUTION
Stop interfering

ISSN 0261-0361



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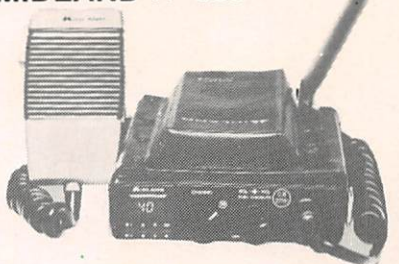
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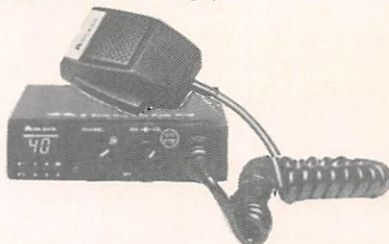
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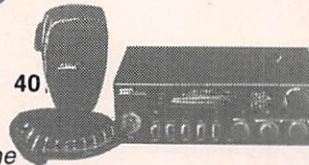
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CB

CITIZENS' BAND

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UPDATE

More Marine Channels

The Department of Trade and Industry has assigned additional VHF radio frequencies for use by marinas, yacht clubs and pleasure craft to reduce congestion on the existing communications channel in coastal waters.

The boom in yachting has resulted in the current 158.85MHz frequency, called Channel M, becoming over used. Problems have also

been encountered by marinas and yacht clubs when they need to communicate with foreign yachts which cannot receive Channel M.

A frequency, 161.425MHz, provisionally dubbed Channel M2, has been made available to yacht clubs whose need is mainly for a single open (simplex) channel on which to pass messages, for instance to a group of yachts in a race.

Marinas, which often need

to be contacted by foreign vessels, may apply for a transmitting frequency of 161.625MHz and a receiving frequency of 157.025MHz which together are known as Channel 80. This is in the international band available to UK and foreign yachtsmen, which is used for communications about handling, movement and safety of ships.

The new channels will require a licence, or, in the case of current (Channel M) licences, an amendment to this licence will be needed. Applications should be made to: Maritime Business Radio Section, Department of Trade

and Industry, Room 613, Waterloo Bridge House, Waterloo Road, London SE1 8UA. Telephone: 01-215 2137/2159.

Pleasure craft, which need Ship Radio (VHF) licences or the longer range Ship Radio licence, will now automatically be granted free licences to operate on Channels M and M2 when applying for their licences. Channel 80 is already included in the Ship Radio and Ship Radio (VHF) licences. Current ship Radio licensees holding a licence for Channel M may also operate on Channel M2 without further authorisation.

All three channels will have equal status. The Department will not identify them on a primary or secondary basis.



Editorial

At the time of going to press, we have just learned of the tragic Hillsborough disaster. As always, breakers throughout the country are already organising fund-raising events including massive sponsored modulations. We have little

news of these events as I write but, going from past experience, I have no doubts that a lot of money will be raised. CBers are always the first to try to help in such situations - it's just a shame that the national press are the last to recognise it - if at all.

On a cheerier note, we are pleased to be able to feature what we think is the definitive article for newcomers to our hobby in this issue. Paul Coxwell is the man with the word processor in this case and, naturally, we are externally grateful for his works of wisdom.

Among other goodies this month are a new bunch of microphones from Pama & Co and a very useful DIY project for a mike switcher box.

That's it. It's Friday and the pubs are open. Happy reading.

STOP PRESS

Phew! Literally hours before going to press on this issue, we have just learned that the famous Satcom has just gained type-approval. OK,

Satcom owners, it's time to break out the bubbly and turn those rigs on again. Potential users can check out the review in our February 1988 (remember, you read it here first!)



Middle East presentation

Once it was considered appropriate for British businessmen to give a jewelled sword or hunting bird as a mark of esteem to valued customers in the Middle East; now it is a 200 watt UHF linear amplifier.

This particular item was presented at the recent Britain in Oman exhibition by Mike Briggs, sales director of Microwave Modules Ltd, to Abdul Razak Al Shahwarzi

(A41JT), chairman of the Royal Omani Amateur Radio Society. It will be used at the society's headquarters in Mutrah.

The Liverpool company, who were exhibiting in Oman, has been a worldwide supplier of amateur radio equipment for the past 20 years, and it currently manufactures a range of 36 products for this market.

In the past decade, however, it has concentrated most attention on developing

communications equipment for professional use, and now markets its television transmission systems, high-powered radio amplifiers and multi-channel microwave radio links throughout the world.

Many of the firm's traditional customers seem to have successfully developed their own careers over the years, and are now in some very influential positions. In Oman, for example, one amateur radio operator

(A41AA) is also His Majesty The Sultan of Oman, while His Excellency Ahmed Bin Suwaidan Al Balushi (A41FK) is both president of the Royal Omani Amateur Radio Society and the government minister for Post, Telegraph and Telephones.

So perhaps it is no surprise that Microwave Modules intends to maintain an involvement in the amateur radio field no matter how well its business develops in the professional market.

Scanning With Less, Can Mean More

Bigger sometimes doesn't mean better, and less can mean more. Sharman's (3 Bury Road, Manchester M8 8FW) have introduced the new "Multistick - DX" VHF - UHF scanner antenna to their wide range of stock. It can justifiably claim to be a single rod multipurpose stick. Although only 1 metre in length it copes with VHF(L) 60 - 90MHz, Air 108 - 136MHz, VHF (H) 136 - 174MHz and UHF 380 - 525MHz to a very high standard. When tested against a 3 rod vertical antenna (outside) of a far greater length it improved the signal strength reading and was less unsightly against the skyline. The hard plastic tube (26mm) contains 4 combined antennas and weighs 410 grams. It comes complete with mounting bracket and clip ready for vertical connection to a pole. Impedance 50 - 60 Ohm with coaxial connection for SO 239 (SH). An interesting feature for users who wish to use this antenna indoors is that it comes complete with a rubber cap at the top and an eyelet (you can hang it one the wall). Tests carried out indoors proved that it worked well across the 4 bands, as it did when tested as a 'static mobile' receiver antenna. Imported from Holland and priced at £19.95, it is a worthwhile investment and made to last through all kinds of weather with far less than the average amount of maintenance.

Mike My Day

Mike maniacs will be pleased to learn that a new Sadelta mobile mike has just been introduced. The Sadelta MM90 is suitable for use with all existing bands of Amateur and CB radio and has been designed to give hands-free operation in the car.

Priced at £49.95, the MM90 uses an electric unidirectional microphone insert for crisp audio quality and comes complete with a control box that allows up/down control of appropriate radios. The MM90 may be powered directly from the transceiver or from the vehicle battery.

Technical specifications:

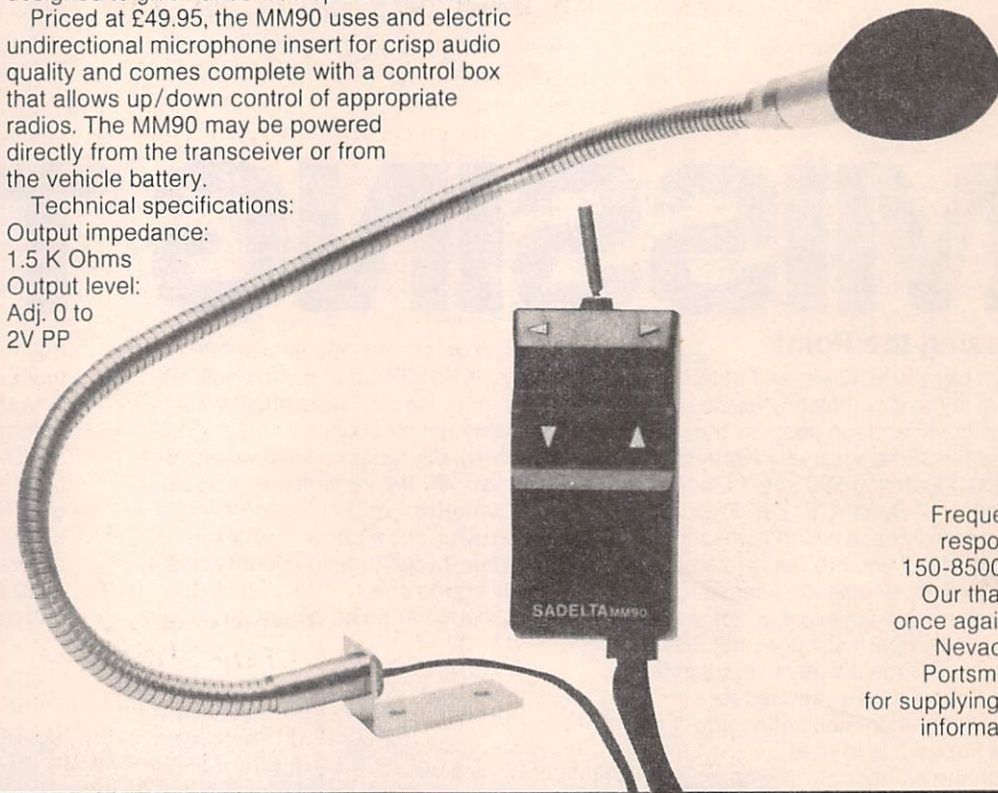
Output impedance:

1.5 K Ohms

Output level:

Adj. 0 to

2V PP



Frequency response: 150-8500 Hz. Our thanks, once again, to Nevada of Portsmouth for supplying this information.

Ham Test Free Increase

The fee for operating amateur radio Morse tests has just been increased from £7 to £10 (from 1 April). This is the first increase since the Radio Society of Great Britain (RSGB) took over the running of the test on 1 April 1986 from British Telecom.

Any applications received

before 1 April for test dates already announced will be accepted at the old rate.

When the RSGB took over the running of the Morse test, the following conditions were made:

1. The test fee of £7 would not be increased for two years.
2. The RSGB would establish a network of at least 70 test centres i.e. one in each

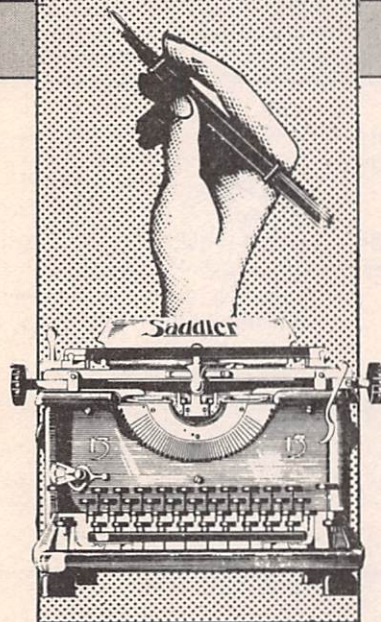
country, region or designated island.

3. Tests would be available every two months at each centre.

The RSGB has held the fee for three years, established a full network of test centres and holds tests every two months in those centres where there are applications.

Any public enquiries should be directed to 01-215 7877.

BACK CHAT



Stand By

May we, through your excellent magazine, make a few comments and offer some advice to our fellow British DXers in the UK on FM and SSB. But first, a little about us. We are Martin and Kate (00 and 500) of Bristol, Connecticut, USA. Martin is British, formerly of Cheltenham. I came over to the USA for a holiday in 1984 to stay with radio friends Chuck (508) and Bobbie (509). Chuck introduced me to his sister Kate and that was it. I came back six months later and Kate and I were married.

We both really enjoy working the radio, especially DX into the UK on SSB and FM. Recently, we have found ourselves very frustrated at the number of FM stations who respond to our callsigns. While we appreciate all those who call, *please*, when we ask you to stand by or when we are calling specific stations, please QRX. The QRM levels coming out of the UK on FM are

extremely high – they average S7-9. We want to talk to as many of you as possible and appreciate that the USA is a rare copy. We cannot begin to QSO with anyone when everyone keeps calling over the top of everyone else. We try very hard to identify a callsign and always ask for other stations to stand by while we work them. We try and keep the QSO short – usually a signal report and exchange of names and addresses for a QSL card. However, recently, even this has been impossible. Please, please be patient and stand by while a QSL is in progress.

On the subject of QSL cards, we have literally received hundreds of QSL cards, all excellent but mostly from stations that have only heard us and not QSO'd with us. We understand QSL to mean confirmation of contact. While we appreciate your kindness, we can only respond to those stations that we have spoken to. It is just too expensive to QSL with everyone, so we have had to limit it to those stations we have worked.

MISSING THE P

Missing the Point

May I reply to G Wilkie and others, who seem to have completely missed the point. I own and run possibly the largest outlet for CB radios in the North of England, carrying 500 sets or more so I definitely ain't anti-CB. Yes, I hold a radio ham licence which is reasonably easy to get if you are really interested in radio. All my people are licensed operators and, believe it or not, we all use CB as well. It still does not alter the fact that CB radio was never intended to be a hobby. It was intended for short-range communication and, if you take the trouble to read up on the matter right from the early days in the USA, you will find that CB didn't come into its own until the fuel shortage in the States left truckers searching for petrol.

Up until then, the only real uses of the band were radio hams who originally had the band and were annoyed at losing it. Did you also know that, originally, under FCC rules, you were not

allowed to talk to stations over 100 miles away? It was illegal and you could be fined for doing so. Therefore, it was definitely not for DXing.

I personally would never call anyone 'old man'. By the same token, I would not use terms like 'XYL' or the even more awful 'chow chow'. I simply consider myself a radio operator and, I hope, a good one.

Now another point. Where do people

get their prices from? I mean you can pay £1000 if you really want to throw your money about. You can also get on ham radio for less than the price of a CB rig. That's why you go on a course before your exam so you can build your own. That's one of the benefits of being a radio ham. As a CBer, you are not allowed to make your own rig. A legal rig must be type-approved which means it has been submitted to various tests to



Again, our thanks for all of your cards. To those stations we have worked and who have not received our QSL cards yet, you have not been forgotten. Please be patient as we are working our way through the pile as fast as we can.

To the SSB stations, we have one question to ask. Why, oh why, do some of you insist on whistling on frequency? Just because the Italian stations do it, there is no need for British operators to follow suit. It's really annoying, especially when you do it over the top of a QSO. We hope that our comments and suggestions have not offended anyone as we really enjoy talking back to the UK. We both look forward to talking to you all again soon.

**Martin and Kate,
PO Box 3224,
Bristol,
Connecticut 06010,
USA.**

OINT

ensure it doesn't cause problems to other radio users - and this costs a lot of cash.

A CB radio is designed to be used by a person who knows nothing about radio and doesn't have to. I am not knocking CB users - it's just a fact, the same as PMR, cellular phones, ship-to-shore radios etc. With all these types of rigs, if no-one twiddles with them, they will not cause problems. Radio hams are expected, by the terms of their licence, not to cause problems to others and to know how to cure and check for them should they arise.

As a finale to this note; a taxi firm or any other business is perfectly entitled to use CB radio as long as they hold a licence and use legal gear. It's what CB was made for - safety and to help small business who cannot afford to use radio telephone. As I have said before, many of my customers use both. Should Mr Wilkie come to York, I hope he will come to see me.

**Harry Tait,
11 Plus 10 Radio Services,
1 Darnborough Street,
York YO2 1JH**

Clever Dick Replies

In reference to the item in the April issue about transmitting data, here is your so-called 'clever Dick'.

Although a simple method, it did the trick. Between a group of friends and myself, one of which was a computer nut, we devised a simplex system on Sinclair ZX Spectrums.

There was no need to use modems as it worked on the Save/Load commands. The program was pre-loaded into the computer so that headerless data was sent, and users were given an address code. The RX/TX changeover was manual.

Computers receiving the data would need to have been loaded with the pre-program so that they could receive the headerless data with the correct address code. The speed of transmission was approximately two seconds for a page of text.

Data was often corrupted by other users of CB transmitting speech on the same channel and was only really effective on signals of 7dB+.

Carrier On

I read with interest the article from the Border Raiders DX Club in the April 1989 issue of your magazine regarding the 30+ carrier signal on 27.125MHz channel 14 coming from a company in Langholm.

I would like to inform you of a similar problem in Hawick border region which, again, is a 30+ carrier coming from a woollen mill to the east of Hawick. Any CB operator in this area will receive this 30+ signal on 27.991MHz channel 40.

It would seem to be funny that the DTI issue a machine to operate on a frequency between 26.957MHz and 27.283MHz, which are the first 28 channels of FCC. This leaves 52 channels and not 55 as stated by the RIS - or are the DTI trying to tell us that we are not going to receive the new FCC channels?

**Blueknight,
Esk Valley CB Club,
PO Box 5,
Bonnyrigg**

Spray Play

I have tried the Pama SWR spray, not only on my homebase but also on my slide projector. The only trouble is I am now getting CB lingo on my projector and everyone in Sheffield is getting a free slide show. I am also getting sound on my typewriter and the TV is receiving



P.L.HILLS, 13 KENTS ROAD, HAYWARDS HEATH, W.SUSSEX, RH16 4HL.

I refer to the system in the past tense because the others have moved to the four corners of the world and, therefore, are out of range of a 4 Watt transmitter!

Changing the subject somewhat, how is it that there is a 0.196MHz gap which is illegal to transmit on in the middle of the two legal bands? Seems a bit silly and, no /'m not - I didn't fall for that SWR spray for a minute!

**Firestreak,
Worthing,
West Sussex**

Ode to Hams

Why do some radio hams think they're the best,
Because they've studied and passed the test,
I wish they could hear themselves talk on the bands,
With their repeated G numbers and constant "old mans".

Why do some radio hams always have moans,
People in glass houses shouldn't throw stones,
Their SL repeater is terribly used,
With people sworn at and badly abused.

Why do some radio hams get out the knives,
Weren't they CBers once in their lives,
So come on "old man" give us a break,
Let's enjoy the hobby, for all our sake.

**A regular reader's wife, fed up with
'ex-CBers', Norfolk.**

my typed words on its screen. What can I do?

**Freelance,
Sheffield**

Dear Freelance, you appear to be in urgent need of psychiatric help. Either that, or you took our April Fool's prank a mite too seriously. - Ed.



Yoktumi Tamashanta programmed the next process into the computerised robot arm. He played an important part of the production of the new Satzumi miniature video recorder.

As he pressed the start button on the console, the robot swung into action, picking up the chips and speedily placing them in the sockets on the board as they ran past.

In the background his Satzumi radio crackled as it picked up some brief interference, temporarily blotting out the voices of The Tengu-iki brothers. The east's answer to Bros.

The arm swung across to the continual line of microprocessors coming from the automatic store on the level below, preparing to pick up the next component in the complex production routine.

The whole Satzumi plant was bristling with the latest in automation, with all parts distribution being carried out by robot drones controlled by the central computer, or by the multitude of overhead distribution tracks that carried parts and assemblies around the factory at breathtaking speed, all under the watchful eye of the same benevolent computer. A mere 27 people worked in the vast automated assembly area, all hand-picked from the best production programmers available. Yoktumi experienced a warm feeling inside as he thought of the honour that such a position brought him.

The robot gripped the delicate chip in its vice-like jaws, applying just enough pressure to take a firm hold on the component without damaging the

delicate connecting pins. Such robots were commonplace in this factory, capable of performing a vast range of tasks from heavy lifting and distribution, to delicate assembly work such as this.

The radio crackled again as the robot swung the processor across the workspace to where the board was arriving just in time to receive the chip. The arm gave a brief imperceptible shudder, as it lowered the chip into place. Swinging back, it picked up the next chip, performed a complex and unexpected vertical rotary movement, and released the chip, projecting it at speed across the workspace and into the face of a very surprised far eastern production programmer.

The radio gave another brief cough of interference.

Yoktumi quickly checked the program as the robot continued its job as before. Finding everything as it should be, he picked up the phone, stopping only to turn down the volume on the radio just enough so he could talk to the central computer voice interface.

As the phone rang, the robot swung across the work area, shuddering as the radio cracked, this time more quietly than before. The hefty arm gathered momentum, striking Yoktumi, knocking the receiver from his hand, sending the frightened programmer ducking for cover.

The arm lurched up into the air, seeming to dance a complex series of almost balletic movements, as though conducting the music on the crackling radio. It paused for a brief moment, poised stationary above the cowering figure. Yoktumi saw his chance. He made a dash for the gangway so as to

escape the mad machine, but the arm was fast, even faster than a trained marshal artist driven by such fear as he had never before experienced. The arm came crashing down against the back of his neck, knocking him to the floor, and pinning him down like a rock lies on a feather.

In the background the voice of the computer interface could be heard against the sound of the buzzing radio, as the multitude of robots continued their tasks as though nothing unusual had happened.

The above story is of course total fiction. The idea of a random radio transmission accidentally interfering with a piece of complex machinery is utter nonsense. Nothing of that sort could ever take place in a 20th century factory. Well perhaps not, but truth is sometimes stranger than fiction and, in this case, history is frighteningly similar.

For some time now, there has been considerable interest in spurious radio transmissions from electronic equipment in use in Japan, leading to a perceived problem of RF pollution.

The Japanese publication "New Era of Telecommunications in Japan" published a study report discussing the situation, saying that: "With development of the advanced information society, frequent occurrences of interference caused by spurious radio emissions from various types of radio and electronic equipment pose a serious social problem."

This might seem to be a bit of an over reaction to what is most probably going to be a problem of a few crackles on the air waves. However, if you add to this the current explosion in the intentional

POLLUTION

use of radio frequencies for business and domestic requirements, we are faced with a picture of rapidly increasing radio traffic having to avoid an ever-increasing amount of random interference.

What with the rise in the use of cellular phones, the operators of these systems have, for some time, been concerned about the availability of channels as their capacity has begun to fill up.

A similar situation has begun to occur with the cordless type of domestic phone that allows the user to wander a short distance from the home base which remains connected to the landline network.

As long as a year ago, manufacturers at the 1988 Brown Goods Show, held in London, were commenting on this problem. They were saying that if the market was ever to reach saturation point, then they might have to start fitting such mobile handsets with a channel selector. This would allow a user to select a different channel to any neighbour who might have bought the same model of phone.

With this apparent overcrowding of the airwaves, it is not surprising (though decidedly unfair) that the government has long been interested in taking back some of the hard-earned frequencies used by the CB fraternity.

However, the problem of frequency overcrowding is not what the Japanese are so concerned about. They are at least, if not more, interested in the uncontrolled release of 'spurious' transmissions from non-transmitting equipment.

The reports from the East are such that with the multitude of electronic equipment currently in use side by side in the home and workplace, these normally passive devices are unintentionally transmitting signals that can interfere with neighbouring equipment, sometimes with quite devastating results.

One story tells of a train radio device being "seriously disturbed" by nearby video games equipment, but by far the worst case of is a Japanese machine operator, actually being killed by a numerical-controlled milling machine, activated when it picked up spurious transmissions from a crane in the area.

With instances of people apparently being eaten by machines in their place of work, it is understandable when the powers that be become so alarmed. Hopefully, the situation in this country has not yet developed to such a degree where this could happen. Having said that, this is no reason to be complacent. We are well aware of the overcrowding of radio frequencies that are used intentionally, and with the deregulation

of radio and other communications media the situation seems set to become worse still.

The possibility of increased overcrowding caused by new demands on the UK airways does not end there. When you start to think of the other likely competitors for space, there is the proposed network of "Zone Phones" that would allow a subscriber to use the system so long as he was within range of a zone phone base, such bases being located in places such as petrol and railway stations and the like. With the possible introduction of radio equipment into trains (as is currently being called for after the recent spate of rail disasters), and many other areas of industry and commerce wanting to take advantage of the easy availability or miniaturisation of radio equipment, we would appear to be on an upward spiral or ever-increasing RF use.

Granted, very few of these systems use high power transmissions with a number of them (such as the railways) operating on a cellular basis, but the fact remains that we seem to be set for a blossoming of the use of our all-too-limited airwaves, with each new user potentially capable of producing or being troubled by these spurious radio emissions.

All these devices will be capable of not only transmitting but more

Wordsmith looks at the problems of interference

RF POLLUTION

importantly receiving signals in an ever-more-crowded electro-magnetic environment. In short, faced with a sudden upsurge in the use of radio, we are going to have to clean up our act if we are to avoid the problem of transmitters interfering with other transmissions. Supposedly passive equipment that accidentally transmits RF pollution, then interferes with intentional transmissions. Or, worse still, with equipment such as the Japanese milling machine talked of earlier, then some serious thinking is going to have to be done about the whole range of electrical equipment that is in use within our society.

Transmitters are going to have to be built so as to produce as little activity as possible outside its frequency of transmission. Receivers are going to have to be more selective as to what they will pick up, perhaps with narrower tuning capability. On top of all this, non-transmitting equipment is going to have to be screened to stop it producing or picking up any stray transmissions that might have slipped through the net.

This whole exercise might sound a bit severe, but it may be the only way of overcoming the situation and if this is done properly, then this could vastly improve the quality of our use of the airways, which could only be of benefit to all concerned.

One possible answer to the problem of spurious radio emissions would be to ensure that transmitters (of all types) are giving the cleanest signal possible. Transmitters are going to have to be more carefully set to specific frequencies, so as to avoid producing the seemingly ubiquitous radio garbage that all too often goes with the use of more closely-packed channels and frequencies. This would seem to point towards higher quality controls and tighter restrictions as to the type of transmitters used in this country.

Similar improvements might not go amiss on receivers, not only to cope with the problem of bleed from other intentional transmitters that would be likely to occur, but also to cope with the increasing problem of RF pollution from devices that shouldn't be transmitting RF in the first place.

Such quality restrictions are bound to have an effect on the price of available

equipment. This might occur in two ways, one being the obvious manufacturers' desire to pass on any increase in production costs, such as tighter design, or the use of closer tolerance components, along with more stringent inspection and test arrangements.

The second way in which the RF boom might push up prices is the lower availability of cheaper equipment that is already on the market. We could arrive at an alarming situation whereby existing equipment no longer falls within the bounds of governing quality standards. We would be unlikely to see the withdrawal of equipment currently in use, but we might see certain models disappearing from the marketplace, if and when standards become tighter. That ultra-cheap imported rig that you can currently buy at your local CB shop could be regulated out of existence! All this seems like yet more centralised meddling in what the radio user can and cannot do, but the tidying up of RF pollution could be of benefit to all of us, and is probably an inevitable fact of life.

Messing around with radio equipment might not be the only way of reducing all this junk on the airwaves, and would probably be overshadowed by a much more effective task.

We have all, at some time or another, experienced problems with the nearby use of unsuppressed electrical equipment. The most well-known culprit in the past was the electric drill with the unsuppressed car or motorcycle coming a close second. The car industry was fairly fast in sorting this problem out when they realised that an extra profit could be made by fitting every car with a radio. This then forced them to deal with the problem of suppression. This extra task might at first have seemed to be a problem for car manufacturers, but like all developments, that which is difficult or expensive one day is soon overcome the next day by the inexorable march of progress.

Much the same thing could be said about the electrics within domestic power tools and the like. If today you nip down to your local DIY mega-huge store, buy yourself a "black and doobie" and plug it in next to a transistor radio; you will get nothing but perfect reception. Try this little experiment with a drill made 10 or 15 years ago and you won't be able to hear Jimmy Young for the crackling of unwanted radio fall-out.

If these well-known culprits have been cured of their antisocial transmitting habits, then this must mean that our problems are over. Surely all manufacturers now take into account the possibilities of RF pollution when designing electrical equipment. After all,

the motor and DIY industries have shown us that this problem is quite easy to solve, seemingly at little extra expense . . .

Have they solved this problem right across the board? No chance. Instead on having a world free from problems of RF pollution, we now have a different set of culprits.

As I sit here typing away on my trusty word processor, I would so much like to have the radio on while I type, but unfortunately the crackle and hiss is so severe that reception is almost totally obliterated. I also know of CB users who have experienced this problem. Worse than this, I can even pick up my computer on my TV set. Images of what is shown on the screen can quite clearly be seen sliding horizontally across the tube on the TV.

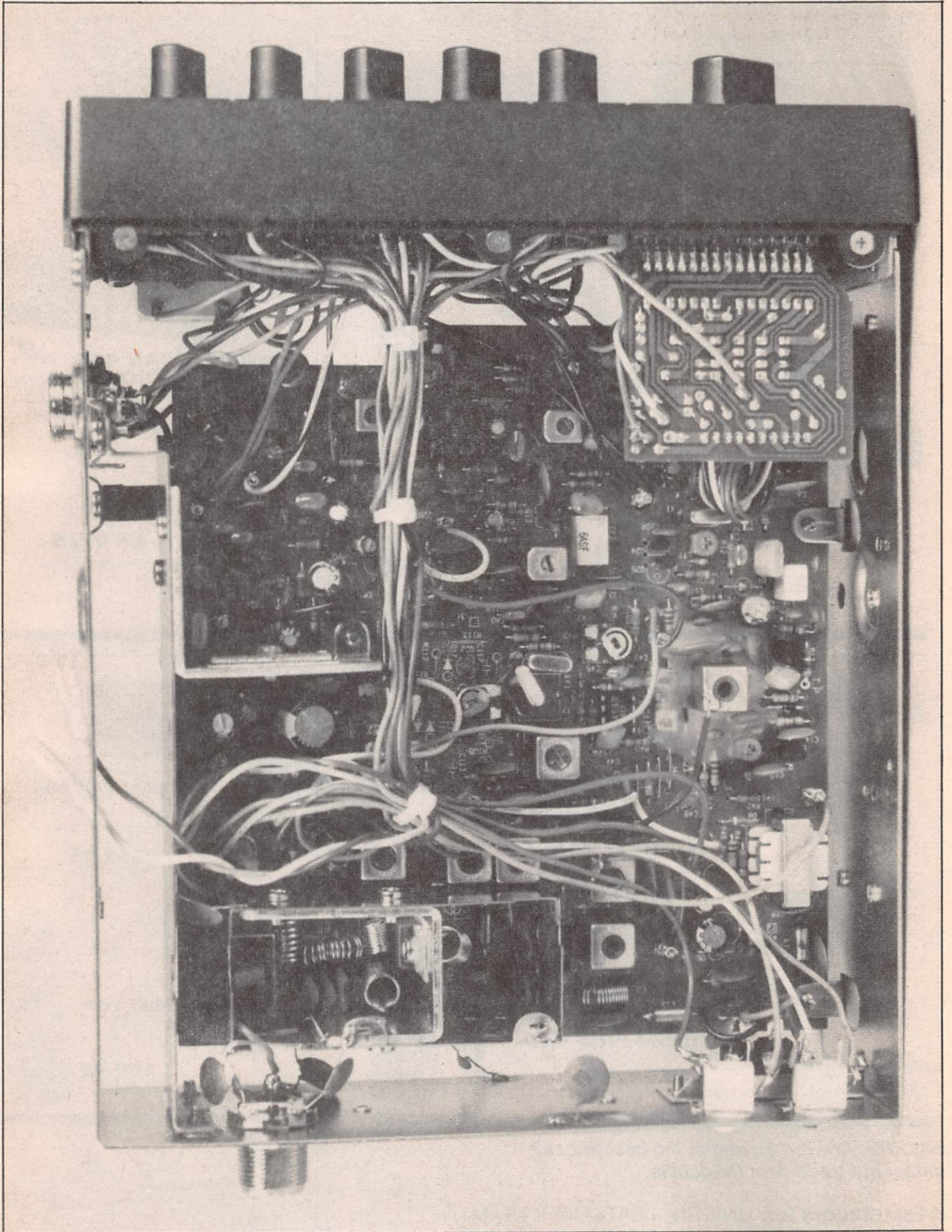
This might be a problem of one tube interfering with the other, but exactly how it is occurring is of little import. The fact remains that the computer is generating something that the TV is picking up.

There was once a time when the CB users of the country were always seen as the culprits of all RF pollution ever experienced. Granted, in some circumstances, CB was to blame for the interference experienced by people on their TV sets, or wherever else the trouble might have been. Many users went to the trouble and expense of fitting filters to aerial systems or co-operated with local complainants by transmitting on low power or at restricted times. Now it seems that the tables have turned, and the CB fraternity frequently have to suffer at the whims of the multitude of computer enthusiasts, and there is the possibility that all RF pollution might not necessarily be from CB.

If we are to avoid this explosion of radio interference before it happens, then manufacturers of all new electrical equipment are going to have to take into account the possibilities of spurious radio emissions. The simple act of screening new equipment would be a first step and might just save us a great deal of trouble later on.

Given that the manufacturers of cars and domestic power tools have shown that this problem is easy to solve, without extreme expense and without making the products uncompetitive, there is now no excuse for this continuous stream of unintentional and unauthorised abundance of radio litter. It is up to the manufacturers of all electronic equipment to take this problem on board so as to ensure that it does not pose a problem in the future, thus making our frequencies much cleaner.

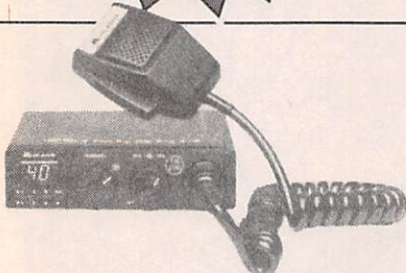
I wonder, could this be the beginnings of the "greening" of our airwaves?



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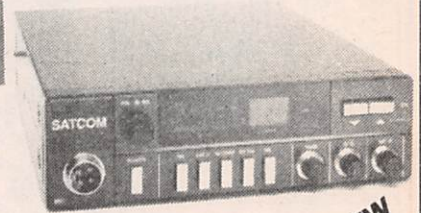
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MICROPHONE SWITCH BOX

Tango 69 provides a handy hint for multi-rig users

If, like me, you run more than one rig, you either have the choice of using separate mics, or else un-plugging each time you use the other rig. If using a base mic, then you can lose a lot of space with more than one mic on the desk.

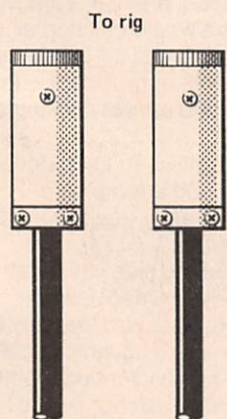
This simple project overcomes this problem, as your base mic can be switched to any rig you are using. The diagram shown is for two rigs, wired for the Cybernet range; Delta One, Rotel, Harrier, Harvard, to name a few, but can

be wired for any combination.

Add another switch and you can run three rigs from the mic instead of just two, and the only wires to and from the switch are for the TX line. All the others are a continuation of the original mic plug.

I suggest you use straight mic cable for the flying leads as coiled cable is difficult to work with and looks less tidy in the shack.

Tango 69



If both plugs are to fit Cybernet rigs then wiring is identical to original mic.

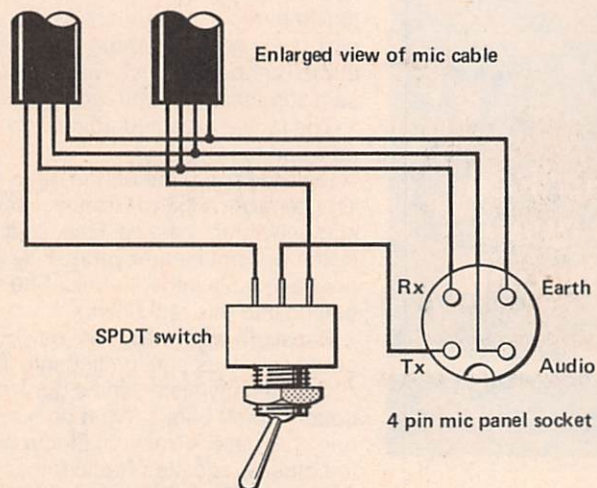
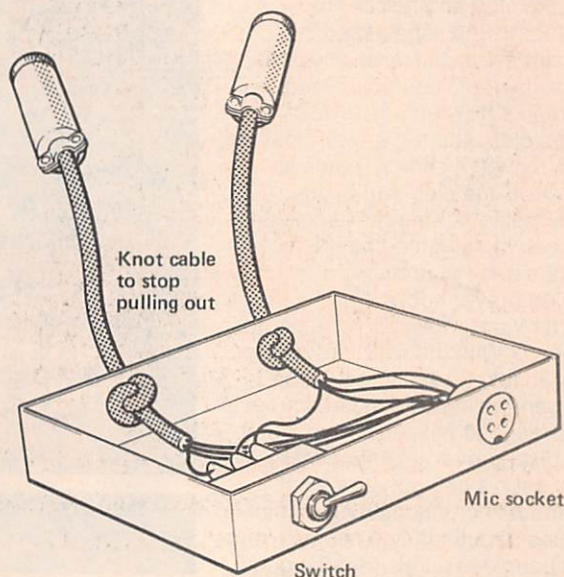


Figure 1. Plug wiring diagram



You may remember some months back I introduced you to my most formidable relation, Granny. Granny was much taken with my mobile rig and did her best to sully my reputation for all time by possessing herself of the mic and behaving like a hooligan.

Well, she's at it again, this time in deepest Kent. I'm doing my best to keep her off the airwaves, all you unsuspecting Kent breakers, but be warned . . . Next time someone informs you England didn't fight two world wars so you could laze around gossiping all day, that'll be Granny.

The thing is, she had made her old folks' home too hot to hold her and they had pleaded with the family on bended knee to make 'other arrangements'. Granny was in no doubt what those other arrangements should be – she wanted to move into my sister's granny flat, empty after the death of my sister's mother-in-law last year. Granny had been beady eyeing the flat ever since.

On the promise of practical, moral and financial support from the rest of the family, my sister agreed and Granny duly moved in. She then looked about her for amusement.

She could no longer divert herself by needling the warden or dropping her spare teeth into other old folks' tea, and she had been warned that harassment of my sister and her family would lead to her being abandoned willy-nilly in the Dartford Tunnel. After one session at the local old people's day centre she reduced the staff and helpers to near-collapse. She stigmatised the members of the local Darby and Joan Club as a 'pack of vegetables' and refused to join (to their unutterable relief), and disconcerted a well-meaning lady from the local church, come to invite her to a 'tea club' run by the parish, by telling her modern Anglicans were a pack of benighted heathens with their guitars and their healing and newfangled prayer books.

My sister was in despair. What to do with Granny? With the warmer weather, Granny had taken to sitting out in the front garden hurling offensive comments over the hedge at passers-by who met with her disapproval. Like the vicar (ought to get his hair cut), the local bobby (should be out catching criminals, not strolling about sunning himself), and a pair of harmless punks (need a good dose of National Service).

In desperation, my sister took the reckless step of asking Granny what she wanted to do. After Granny's first suggestions had been firmly squashed (standing for the local Council and learning to drive were two of the more

Lady Breakers

Our Relations

**Disaster strikes
as Filly's gran
goes on channel**

hair-raising), Granny remembered Citizens' Band. She had a lot of fun with 'that radio lark', she told my sister. Could she have a radio of her own?

Now, neither my sister nor her

husband is a breaker, which is their only possible excuse, as far I'm concerned, for their unbelievable stupidity in agreeing to Granny's scheme. I think they pictured her sitting quietly in a corner of her living room huddled over a mic, chatting up passing motorists and lecturing all and sundry on the deplorable decline in modern manners and other favourite topics. Naturally, they called me in to advise and help set up Granny's base station.

My first instinct was to emigrate to Australia. On second thoughts, I acknowledged my duty to Citizens' Band and, indeed, the breakers of Kent. Granny had to be stopped. I went down to Kent and did my best to talk her out of it.

She would not be talked out of it. If any foul-mouthed yobbo gave her any lip she would give him a piece of her mind, she said. If anyone dared to play any filthy modern row in her hearing, ditto. She would not button-push, swear, use channel 9, or upset anyone. She would be a model breaker (said with a saintly air). She would call herself the Galloping Granny and if I didn't help her the nice young man next door – that house with all the aerials sticking up – would.

I know a threat when I see one. I changed tack and attempted a compromise. Granny could *listen* but not *talk*. How was that?

Granny eyed me sideways. Rather to my surprise, she agreed. I was suspicious, but I couldn't see any harm in letting her have a rig which could not transmit. The family clubbed together and bought a base station with all the works, and I set it up for her, taking care to remove the mic. My sister reported hours of peace as Granny sat listening to whatever conversations she could pick up, only occasionally hurling insults at the (unhearing) radio when someone said something that offended her.

The family breathed again. Life returned to normal.

My sister rang me up the other week. The talk got round to Granny. How was she getting on, I asked. Fine, said my sister. Brilliant idea of yours, Filly, letting her have a rig without a mic. She's really getting into this radio thing.

Pause. In what way, I asked cautiously, was she 'getting into it'?

Oh, said my sister, she's gone out and bought some books. What books? Well, one was called Practical Electronics and the other was called Radio for Beginners. Good joke, wasn't it?

I put the phone down with a hand that was none too steady. A picture flashed into my head. Granny with screwdriver in hand . . . No, I thought, she wouldn't. She *couldn't*. Could she . . . ?

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THE SHACK RACK

Chest Expander, proprietor of The Shack, proves that not all disabled people are helpless

After being involved with C.B. radio since late 1979, it came as quite a shock to my system four years ago when, whilst playing with two children, I badly hurt my back and overnight I couldn't do many of the things I had taken so much for granted.

All of a sudden, good old "Chest Expander" couldn't walk 50 yards without sticks let alone put up a home-base aerial. It was then that I first experienced the other side of the fence, that I didn't know existed. About two years ago, just before an operation that left me bed-ridden and confined to a wheelchair, I started getting interested in

the internal workings of CB radios.

To cut a long story short, after a lot of late nights, I finally reached a level of competence where shops began to send time-consuming jobs to me, and I started to stock components and accessories.

In February 1988 it became quite clear that things could no longer remain

hobbyist as word had started to get around about a breaker in Derby who repairs rigs from a bed, and I was quite worried about not-so-friendly breakers getting the wrong idea about things. Now it may surprise you to know that your local DHSS or council can be very helpful if you approach them in the right way, although I must admit that when I first contacted the DHSS and told them I wanted to set up a business they thought I had escaped from somewhere! For the information of anyone out there in a similar situation, a disabled person can qualify for therapeutic earnings of £27 per week subject to a medical and doctor's letter if you can show that what you are doing will help keep you alert, active and generally help your condition. So, be a devil, don't sit and dwell on things, find something to do and make use of the allowance and enjoy yourselves at the same time.

As regards running a business from a council property, this is normally a big "no-no" but, in my case, I invited my area housing manager to visit me, explained my ideas and, to my surprise, I was given permission to go ahead immediately. Obviously serious consideration should be given to neighbours, parking etc and, in my case, I have gone out of my way not to cause any inconvenience to anyone.

Since "The Shack" started up in April 1988 we have been fortunate enough to have acquired the last remaining spares from Rotel Hi-Fi, Audioline (Harry Moss) and Mustang (Laltex) and recently a distributorship for Piranha car burglar alarms. It must be pointed out at this time that in all cases each company knew my situation and I received every courtesy possible. At the beginning of September 1988 I received a call from a Scottish gentleman who told me it would be in my interest to contact "Marconi Instruments" and, knowing the reputation of the company, decided to take the advice expecting it to be a wind-up. To my surprise, they knew all about my situation and informed me that their area sales manager (Mr Tony Mansey) wanted to visit me. Upon the meeting taking place, Tony brought me a current catalogue and showed me a picture of the Marconi Radio Communications Test Set 2955, which has 11 pieces of test equipment in one, such as RF & AF generators, frequency counter, power meter sinad s/noise distortion meter, deviation meter, AM, FM, duplex. In fact it will test anything up to 1,000 MHz with the added attraction of bar charts and storage scope.

It was put to the board at Marconi and, thanks to Tony, I have now on loan the most up-to-date, accurate and all-round versatile piece of test equipment on the market.

It is obvious to any technician the difference this makes in quality and speed of repair but for any layman not understanding, I used to have

equipment all over my bed and my wife would have to be on call to pass this and that, where as now it is all in the one unit and has given me the independence I never thought possible. Not only that, Marconi maintain and insure the equipment for me and words can never express my gratitude for their assistance.

I could not finish my article without asking readers out there to share a few ideas with me. I would like any readers out there to send information to me which they feel might help any disabled person or good buddy, such as ideas for projects which a disabled breaker might be able to build which would make life easier on the rig i.e. larger home-built SWR meters with 3-4 inch meters for poor sight or rubber cups that fit over channel selectors for breakers with poor grip, just to start the ball rolling. Whatever happened to the supply of channel talkback units for the blind?

I, for one, would like to hear from any

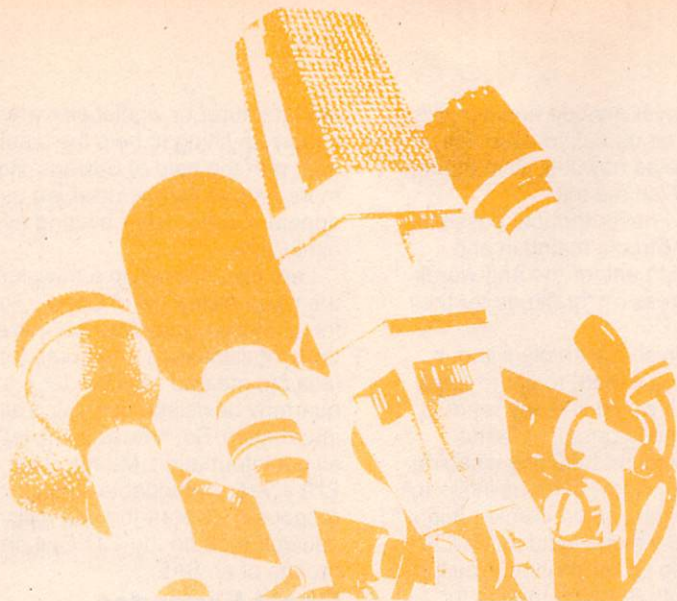
manufacturer or wholesaler who can supply anything to help the disabled and, with the help of Citizens' Band, more articles for the disabled might appear in the future covering events and exhibitions.

I am also setting up a newsletter for the trade called "Mod Cons". The idea is for all those rig doctors out there to send their modifications and cures for known faults to me and I will produce a quarterly newsletter itemising all your information. So, how about it, let's pool all out information. Membership costs £10 a year (refundable if insufficient response). I'll start the ball rolling for a squelch mod on the 134 Cyb chassis on receipt of an SAE.

Chest Expander

The Shack,
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Tel. 0332 760353
Fax. 0332 767958.





OVER THE AIR

Sunrises DX Group would like to announce a change of date for their 1989 Eyeball. It has been put back one week from the previously advertised date – so it will now be on the 14th October 1989 at the same venue. Further details from PO Box 7, Bridgwater, Somerset. Tickets are now on sale.

Over the past few months "Back Chat" has carried some very interesting letters concerning SSB. It seems that the majority are in favour of a 'legal' system with certain safeguards. My thanks to Dave (DX 511) for the information that New Zealand has just been given an allocation of 'legal' SSB channels (40) from 26.330-26.770 MHz. So perhaps it is time for our UK Government to start thinking about what the users want!

Lo and behold, in the April issue of Cit'Band "Back Chat" section, Mr A B Maxwell (Director of the RIS) took the time to write in about the laws governing the sale of illegal goods etc. I still believe that a lot more could be done towards clearing the frequencies of music players and foul language merchants. Although I have no doubt that, along the way, some good users

will be caught. My main concern is that a few retail outlets will and are continuing to sell illegal goods as legal, just so that they can make a profit. It pleases me to know that Mr Maxwell takes the time to read our magazine so, whilst I have his attention, perhaps he would care to pen a reply to my following 'open letter' to him . . .

Dear Sir,

Many breakers are unhappy at the state of our UK frequencies. Many complain, but nothing ever seems to come of their complaints. Could you explain the best way to go about getting action from the RIS and what information you require?

Many stories (true or otherwise) are being told about the possible loss of UK FM (27/81) after 1992 in favour of a common European standard which we are told is part of a "Common Air Interface". Is this true? And what will be the deciding factor that will determine its loss? Can we expect to see the UK left with one frequency only (CEPT) and, if so, will all other EEC countries accept the same policy? As you know, other

EEC countries have their own sets of frequencies – some don't even have a laid down set of guidelines. So how will the UK bring pressure onto countries such as France, Spain and Italy to drop everything that they have in favour of CEPT only. Surely it would be better to allow each country to have an allocation of spectrum for its own users (which may allow the continuation of present systems) whilst adopting CEPT as 'a' common frequency. This would then give each EEC country the chance to expand useage on the 'allocated' part of the spectrum (increasing useage and revenue from extra licence sales) for future years.

According to official statements, we are told that CB users are on the decrease, based on the fact that licence sales are down. I and many others would dispute this as the licence sales do not reflect the true amount of UK users. The main reason (one of many) for the drop is that users have lost faith in the DTI's ability to control CB radio and clear up the channels. The true user figures would be nearer 200,000 thus proving that the policy of the RIS 'does not work'. Perhaps the DTI (RIS) should send out questionnaires to find out the reasons why licence figures are down. These could be sent out through CB bodies, shops and other outlets. However, it would be unwise to ask for users to fill in their names and addresses unless they wished to do so. Perhaps you could include a section that would ask users to declare which frequency(ies) they use and if they would like SSB. This would give you a true reflection of what the users want and what they use. If you are as concerned about CB as you lead us to believe, then this is a step in the right direction!

Can you also tell us when we can





that Paul has recovered from the shock of having a sandwich snatched from his hand by a young fox, as he put his arm out of the car door. That was just about the time that he vanished off channel - oh well, another vacant spot lads!

The Scottish Association of CB Clubs (S.A.C.B.C.) held their AGM on the 12th March and the following are the elected Committee for the coming year:
 Chairman - Tony (*Rock-a-Jock*),
 Secretary - Alistair (*Copper King*),
 Treasurer - Angus (*Sea Wolf*) and
 Committee Members - Neil (*Blue Knight*) and Robert (*The Duke*). Any Club who would like more information about S.A.C.B.C. should write to: PO Box 1, Glasgow G69 6EF.

expect to see a change in the law to allow $\frac{1}{2}$ & $\frac{5}{8}$ wave antennas to be used on all present UK modes? Also, why can't we have a reduction on the licence fee for OAPs and handicapped users?

Clearly breakers are concerned about the future of CB radio in the UK and, after 7½ years, things have not changed to improve its use. Some would even say that the DTI have adopted a policy of 'low key policing' in order to run down the numbers of users. This would, in turn, allow the DTI to put forward an argument to take away UK FM (27/81). It is clear that CEPT has not taken off as was expected and that breakers are happy with UK FM. Clearly licence figures would decrease drastically if UK FM was withdrawn because you would end up with many thousands of breakers becoming 'pirates' of the system and, in fact, it could well prove to be a bigger problem for the DTI than it was before legalisation (pre-1981). So if your financial budget won't stretch to helping clear the frequencies now, it surely won't then!

I look forward to reading your answers, as I am sure do the other 199,999+ breakers.

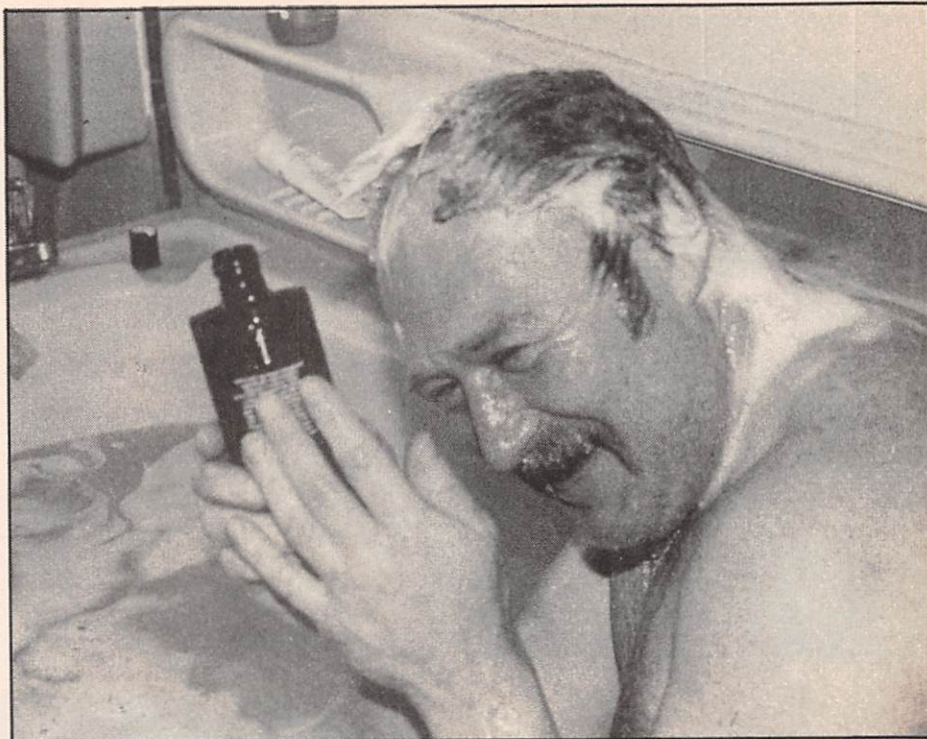
Shepherd Man

The other evening I ventured out to my usual spot in Sussex only to be greeted by the worst rain that I have seen in years. My thanks to Oscar Charlie 01 (Peter) and his friend Terry. Also Bonny & Clyde plus all of the others on the 06 CEPT. Sorry for the lack of names etc but, I lost my pen and I wasn't about to get out of the car to find it! The QSL returns are on their way (if they haven't already arrived). I also hope



It was good to see Medico 9 mentioned in the April issue. They work very hard throughout the year both at events and outside of CB. The Breaker-way CB Club presented a cheque for £2,400 to the Trinity Hospice in South West London on the 14th of March. The cheque was presented to Dr Chamberlain and two nurses. The money was raised by the club's members and friends and from donations etc. Trinity Hospice has again been chosen as their charity for the coming year and they hope to raise an even bigger total. Well done to everyone for their hard work and support in this major 'operation'.

The 1 Sierra Bravo Club held their first ever evening eyeball on Saturday the 25th of March in their home town of Stevenage, Herts. For those who have never been to Stevenage – it is a town with so many roundabouts that it would even make Dougal, Zebedee and Florence dizzy! It also has a network of pedestrian/cycle paths built under roads, which would do justice to the Tour de France. Although the Club has only been going for about one year the dance was very well attended by its own members and fellow breakers from Somerset, Kent, Sussex, London, the Midlands and points further north. The food was good, as was the company; the music played and the booze flowed.



I had a great day with Cliff (*Quickfire*) and other friends that I hadn't seen since last year. My thanks to him for the chance to visit his local pub and watch the barmaid struggle to walk in a skirt that was either a 'belt' or an 'elastic band'. And a fantastic evening meeting

breakers including: Captain; Uncle Tom; Breakdown; Tea Bag; Beachcaster; Medic One; Joe 90; the 'ATs'; Sunrisers; Gravesend & Maidstone Breakers; Barney Rubble; Giggles; Colin (Zoe's got the white horse, lads); Mike; Keith; Graham; Lager Lady; Gordon; Phil; Frank; Barry (Baz); Brian; June; David (1 SB 03) and his girlfriend. Last, but by no means least, Yorkshire Man (John) and Goldilocks (Chrissy) kept me supplied with coffee and a bacon sandwich on Sunday morning. I am looking forward to next year's evening eyeball. If you would like more information about the 1 Sierra Bravo's, write to: PO Box 23, Stevenage, Herts SG1 3TF. PS – Cliff. The lads want to know 'when is the wedding?'

Thank you to all those who have sent in information about eyeballs etc. Although there are still a few that I haven't had, I have come up with a list of the ones that I will be at: Mercia – 3rd & 4th, WDX – June 10th & 11th, Southern Eagles – June 17th & 18th, Warminster – July 9th, Mile Oak – July 16th, Golden Valley – August 12th & 13th, Whisky Mike – September 9th & 10th, Solway Pirates – September 29th/30th & October 1st and Sunrisers – October 14th. Please keep sending in details of events and maybe even a report with photographs of others that you go to which may be printed in the future.

Deregulation could mean many things, and it would be hard to know in which context the DTI may be considering this for CB radio (if they are at all). Some readers may very well remember that I touched on this subject a few months ago. Since then, I have been giving this some thought and I have come up with the following. As nobody is 'actually' sure if or when we can expect deregulation these are only



my thoughts and I would welcome your ideas on the subject.

This present Government seems set on a course of selling off many different things; one of these could be parts of the radio spectrum. To make this effective and financially viable for business interests, we could find our part of the spectrum sold off in a 'block' i.e. from 25 MHz to 30 MHz, or in a combination of block parts in a variety of spectrum lots. Something along the lines of 'taking the good with the bad'. As with all businesses they will want to show a profit and as it will probably mean that they will have a short-term lease on the spectrum allocation (say 5 to 10 years), hence the profit return will have to be at a very fast rate.

So, would it be possible for us to lease or buy our own part of the spectrum, and if so who would run it? For us to do this we would have to employ some full-time staff and/or have to oversee the running along the same lines as the RSGB.

Licence sales would have to increase as the DTI/Government would want financial security that we could meet the spectrum payments or they may even decide that we must pay the agreed sum up-front. So, do we or can we guarantee the finances? If our frequencies were sold off in a 'clearance sale' who would enforce the laws governing its use? And would we be

better off? These things and more will play a very important part in any future plans to deregulate and they must be considered as part of the complete package.

Deregulation – would the DTI consider a total deregulation i.e. an 'anything goes' situation, with no rules, no laws and no MPT guidelines? Take any one or two of these in any combination and the answer is disaster. No rules combined with no laws may very well allow for the use of 'any amount' of power output through any type of antennas on any part of the specified frequency. This may sound good at first, but the bleedover would be astronomical. And remember that without any legal recourse would we then be left to take a fellow breaker to Court? The DTI are always the first to say that CB radio has been known to bleed onto other services even on our very low 4 watts and that, as an unprotected service, we play second or even third fiddle to both business and emergency use. How would we then stand legally in a situation where we wipe out these services or a part of the spectrum which has been 'sold off' to business interest? No MPT guidelines may well allow for the importation of rigs which are not only sub/standard, in quality of parts but, in the quality of safety.

It is an area that will need a lot of consideration by each breaker and I am sure that each reader will have their own thoughts and ideas. What I would hate to see is our present systems get worse than they already are and have been since 1981. But, I do believe that there is scope for improvement in the future, and that the future should hold a brighter outlook for CBers. More direct consultation with users as to their needs and wants. Also that we should get a more reliable service from the RIS. And, most of all, is the need to allow other CB systems to become legal – after proper consultation with the users (to get it right from the beginning).

Think about it Mr Maxwell (if you are still reading). The DTI/RIS will never stop the use of illegal equipment or the use of SSB and the like; you don't have the finances. So why not give us a properly set up system that we want? It would give you a much greater control, and increase revenue.

My final thought for this month is: I wonder if Pamella Bordes could apply for a DTI Enterprise Grant for new businesses – and if she would get the support from certain MPs on her application form!

Please send any replies or information to me at: PO Box 429, London SW19 2UU. I look forward to seeing many of you at an event this year.

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These two PLL devices from Toshiba are used extensively by Uniden in all their latest chassis. The 9106 is designed for the regular FCC band allocation,

and the 9119 caters for the "CB 27/81" British channels. In other respects they are identical.

An external crystal oscillator is required to provide the 10.240MHz reference signal, which is internally divided down the a 5kHz input to the phase detector. Programming to the I.C. follows neither straight binary or BCD channels, but is what at first sight appears to be a rather haphazard system. Closer examination however, reveals that the input codes are based on the on/off settings of the seven-segment L.E.D. channel display, thus allowing a less complex channel switch. The same poles on the switch that feed the display can also be coupled straight into the PLL programming inputs, leaving the ROM to sort out the "mess". Having been processed through the ROM code converter, the final N-codes come out as shown in table 1. Note the increments of two for each channel, due to the 5kHz reference signal.

The VCO in these chassis runs 10.695MHz below the channel frequency during reception, and is fed directly to the PLL I.C. without the need for a downmixer stage. A check on channel 1 (using the TC9106 U.S. chip) gives 5kHz multiplied by 3254, which equals 16.270MHz. Add the 10.695MHz and you get 26.965, the frequency of channel 1. Switching to transmit, the N-codes shift upwards by 91, giving an increase in VCO frequency of 455mHz. This allows the 10.240MHz reference signal to be mixed with the VCO output to obtain the necessary carrier for the channel. The transmit/receive switching is achieved by a voltage applied to pin 8. If you refer back to data sheet No. 2 (LC7130/7131) you will notice that both the N/codes and the mixing scheme are identical. The main difference in these PLL devices is the use of BCD in the LC7130 and seven-segment coding in the TC9106.

The TC9119, designed for British

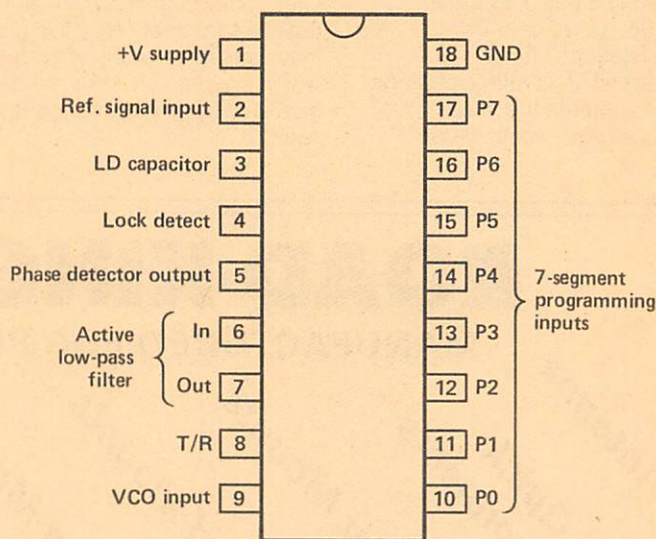
DATA SHEET

9106/9119

radios, functions in exactly the same was as the 9106, the only difference being in the N-codes programmed into the ROM. These are partially shown in Table 1. The figures shown actually give channel frequencies of 27.600, 27.610MHz etc., some 1.25kHz below the required frequency. This is taken care of by increasing the reference frequency to a *little* above 10.240MHz. This gives a basic reference input to the phase detector of a tiny fraction over

5kHz, which when multiplied by the 300 or so of the N-codes gives the extra 1.25kHz necessary.

As with many newer PLL chips, an active low-pass filter is provided for connection between the phase detector output and VCO control input. The only other point worth noting is the slightly unusual function of pin 3. This is used to determine the time constant for the lock detector, and is tied to ground via a suitable capacitor, typically 0.22+F.



Pin 4 goes LOW to indicate out-of-lock condition
Pin 8 should be taken HIGH for transmit, LOW for receive

TC9106/9119 pin-out diagram

Table 1 N-CODES IN ROM

Channel	TC9106		TC9119	
	RX	Tx	Rx	Tx
1	3254	5393	3381	3472
2	3256	3347	3383	3474
3	3258	3349	3385	3476
.				
.				
.				
38	3338	3429	3455	3546
39	3340	3431	3457	3548
40	3342	3433	3459	3550

MIKE MAGIC

There's quite a few very good reasons why you shouldn't fiddle about with the mike supplied with your rig, including obvious ones, like they were both designed by the manufacturer to work with each other . . . However, Cbers will be Cbers and sometimes mikes go wrong, or get broken, so there are circumstances when a replacement mike is in order. Now that the lecture is out of the way, let's take a look at three new mikes from Pama. By the way, sorry to disappoint anyone wishing to sound like a Dalek, or pretend they're modulating from inside a sewer pipe, these mikes have no special effects, and one, at least, might even make you sound a little better . . .

First away is the **DMC-520** – all yours for £8.95, or less. It's a straightforward replacement mike – it uses a standard dynamic microphone capsule with an impedance of 500 ohms and frequency response of 200Hz to 5kHz. It has a normal PTT switch, mounted on the left hand-side of the case. It comes unwired, without a plug, but it uses the standard four-wire connection and switching system of yellow (mic), black (Rx), red (Tx) and braid (shield). A connection diagram

is supplied. Performance is as you might expect from a bog-standard mike – perfectly adequate for the job and compatible with 99% of all rigs. If you simply insist on making yourself heard – or at least, have an uncontrollable urge to make loud noises then the **DMC-531** power mike may be for you. By now you should know that power mikes are not going to increase the output signal from your rig – they don't work like that. What they do is to increase the amplitude of the output signal from the microphone, in the hope that it will increase the modulation level of the transmitted signal. Sometimes it works quite well, other times it simply distorts the voice, especially if the level is turned up too high. There are a few circumstances where a power mike might prove useful; distant copies are a typical example, where the extra 'punch' could make the difference between being heard, and getting lost in the mush. Around town it's probably not going to do a thing for you, except maybe distort your voice.

Three inexpensive mikes from Pama for your perusal this month – Saul Wright reports

With that in mind the 531, which will cost you around £12.95, does its job. It's certainly a more purposeful-looking design than the 520 with an unusually long PTT bar that occupies nearly three-quarters of the side of the case. Amplification is provided by a two-transistor circuit, mounted on a PCB inside the case. The amplifier is powered by a single 'AA'

will sell for around £13.95. It's a classic *teardrop* design, somewhat reminiscent of the **K40** – it certainly feels pretty substantial. The reason why was revealed during an internal examination – a hefty metal weight is bolted onto the inside of the case . . . It's sold unwired, without a plug, and uses a six-wire connection system.

The microphone capsule is a high-quality design, a definite improvement over the usual inserts used in CB mikes. According to Pama they're quite popular with



type that fits into a compartment on the rear of the case. The gain is variable, set by a tiny thumbwheel protruding from the top of the moulding.

The 531 comes ready-wired with a standard 4-pin mike plug. How well it works depends to a great extent on the type of rig it's used with. We tried it on several different models – it seemed to work best (distort least), with Uniden and Midland designs.

Finally we have the **DMC-538** which

professional PMR users and radio amateurs. The reason is plain to hear, speech quality is very good, crisp with a balanced tonal range and without the usual 'tinniness' of the cheaper dynamic and crystal microphones. This is one mike that will almost certainly improve the audio quality of almost any rig.

You can get more details on any of these mikes from: **Pama & Co, Pama House, 433 Wimslow Road, Withington, Manchester M20 9AF. 061-445 8918.**

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Starting out in the strange

Welcome to the world of Citizens' Band radio! If you have just bought a radio and are starting to get acquainted with CB, or if you are considering using CB radio as a hobby or to assist your personal communications, then read on.

Citizens' band radio started in the United States way back in 1958, when the Federal Communications Commission (the American equivalent of the British Radio Department) introduced the two-way radio service for personal and business communications. The idea was that a small business could fit a transceiver into their office, pick-up truck, warehouse across town, or wherever, thus providing a quick and relatively

Begin



world of CB? Paul Coxwell offers a few hints

inexpensive way to send important messages. On a similar basis a family could install a radio in their home, or car, their shack down by the river, and so on. Portable hand-held radios also allow communication between hikers, construction workers, forest rangers, or members of a family having a week's break up in the mountains.

Citizens' band radio was therefore intended to be a short-range (up to about 10 miles or so) radio service for anybody to use, without the need to pass a technical examination for an

avoid traffic pile-ups by giving advance warning of bad conditions. With petrol getting harder to find CB became an important part of life for many who spent a great deal of their time on the road.

Throughout the same period people had also started to realise that CB radio was also a good way to "meet" people. Along with the message passing that the service was intended for there were a growing number of talk clubs – people just chatting for the fun of it, either because they were lonely, or couldn't get out of the house much, and other

CB radio in the United Kingdom, and people started asking why there couldn't be a similar service in this country. Many demonstration marches were organised, some took place, and discussions started in Government circles. Fed up with the long wait, a good few thousand people had started bringing American CB radios into the country and using them illegally. A 1968 law specifically prohibited importation of such equipment, so transceivers were smuggled into the country in various ways.

mer's uck

amateur radio licence or pay out expensive mobile radio licence fees. Whilst the service was officially designated as Class D, it is now more usually known as 27 megahertz, 11 meters, or just Citizens' Band. The two former designations both refer to the waveband that is allocated to CB radio, and are two different ways of expressing the same thing.

Hobby use of CB

Originally every licence issued was also allocated a call-sign, which was to be used whenever a call was made on the radio. All units operating under the same licence (such as that purchased for a family) would use the same call-sign with a "Unit 1," "Unit 2," "Base," and so on added to the end. Transmissions could therefore be identified both to other units of the same licence and to all other users of the band. The 23 channels allocated to CB were planned so as to allow some for use only by units operating under the same licence, and others for use between different call-sign users. An emergency channel was also established (the well-known channel 9), with many police departments and highway patrols monitoring for urgent calls.

Although use of CB radio grew steadily, it was the succession of fuel crises that caused a boom in the 1970s. Drivers of both cars and trucks had realised that CB radio could help them

similar reasons. Band planning was becoming a thing of the past, and the FCC soon had to increase the number of channels from 23 to 40. The previous restrictions of which channels could be used for what purpose were dropped, with the exception of the emergency channel. In the time since then the band has veered more toward a hobby and away from the originally intended personal radio service. Call-signs have been formally discontinued, as very few people were still using them, in favour of a nickname known as a "handle".

Meanwhile, across the ocean . . .

The late 1970s saw a growing interest in

Finally, after a few miles of red tape, the British Government decided to officially introduce CB radio in 1981. The equipment authorised in Britain is not quite the same as that used in the United States, Canada, and many other countries throughout the world, but it is very similar. Basically it works on slightly different frequencies (but still 27 megahertz nevertheless), and uses a different method to carry voice signals on a radio wave.

At the same time a CB service on an alternative waveband was also introduced. This is the 934/81 service, so called because it operates in the 934 megahertz UHF (Ultra High Frequency) band. This has so far seen much less use than 11 metres, attributable to the

Adjust your antenna with a SWR meter



Beginner's **L**uck

higher cost of equipment, the poorer range under certain conditions, and because 27mHz was already well established.

The final stage of CB development in England came recently, when the Government introduced yet another CB standard aimed at bringing all of Europe onto the same system (an aim unlikely to be met for a long time, if at all). This "new" system has been in use throughout many European countries for a good few years, and is based on the original American system, but with slight differences. If all these different standards seem confusing, they are! To set the record straight, and provide you with an understanding of the various systems, you must learn some technical jargon.

CB systems

First of all let's take two terms you will frequently hear – AM and FM. AM is short for Amplitude Modulation, and without getting too boring it is simply one of several ways to make a radio wave carry your voice across space. This is the earliest of the forms of modulation used, and has been the backbone of radio since the first voice signals were ever radiated. FM however, is Frequency Modulation, and is another way of performing the same basic task of persuading a radio wave to carry your voice. The original American CB system uses AM, as do several other countries. The 1981 British CB service and the European service, commonly designated CEPT, use FM. The two forms of modulation are not very compatible with each other, so you need an AM radio for AM signals and an FM radio for FM signals. Fairly simple so far.

In practice you shouldn't have too much trouble. If you're in the United States you will buy a transceiver that uses AM (or a derivative of AM called Single Side Band), and if you're in England you'll use FM. All transceivers made to the British 1981 specification will have a stamp on the front panel that says "CB 27/81" or "CB 934/81." That will tell you that the radio is FM. The latest CEPT sets are marked "PR 27 GB". American transceivers should have a plate on the back that states that the radio complies with FCC regulations, or words to that effect.

The next point to realise is that channel 1 isn't always channel 1, and channel 40 isn't always channel 40! The radios now used in most countries have 40 channels. In other words you can set a dial to any one of 40 different positions and have a different conversation on each. For two people to talk to each other they must be on the same

channel. In most countries this situation is fine, but in Britain we have some more confusion to add. The original British system introduced in 1981 used 40 channels that were totally different to the American system (and every other system in the world). The CEPT system, now legal in Britain, uses the original American 40 channels however, so we have two sets of 40 channels that at no point coincide. The 934 megahertz radios are entirely different again, and have 20 channels available on them.

The choice of which band to use depends on several factors. In terms of technical merits there is very little worthy of consideration between CB 27/81 and CEPT. The latter has tighter technical standards, but these were mainly aimed at reducing interference to other users rather than directly affecting performance of the radio as far as the user is concerned. If you are about to establish a point-to-point communication system, such as for three parts of your family in different homes in town, it is of little importance which system you use, so long as all the radios are designed for the same band (they don't have to be the same model of course).

The CEPT channels are quieter than CB 27/81 in many places in Britain, and thus offer less interference, but CEPT is subject to far more interference from strong European signals, which are prevalent for a great deal of the time. If your budget can stretch to it, 934mHz is a good system for many people in this position. For technical reasons the band does not suffer interference from stations many hundreds or thousands of miles away, except under the rarest of circumstances, so do the two 27mHz bands. The cost of equipment is the

main deterrent to this system however, along with the need for very careful installation to achieve the best results. The equipment designed for 27mHz isn't quite so fussy, and is therefore a little easier to successfully install.

For those interested in local chat or talking afield to the rest of Europe, 27mHz is probably your best bet. The CEPT radios will have no trouble receiving many European stations during favourable conditions. Various parts of Britain seem to have different proportions of people using the two British 27mHz bands, so local advice should prevail, unless you can afford two transceivers!

A guided tour

Now's the time for a quick trip around the controls of a typical CB radio. Not all radios will have everything listed here; you should choose a set based on what facilities you actually need.

On/Off/Volume. You shouldn't have too much trouble with this one! It works exactly the same way as the volume control on a television set. You should note however that the volume control only affects *incoming* signals. It has no effect on the volume of your transmission.

Channel Selector. Used to select one of the 40 possible channels found on a radio. Older sets had an illuminated dial that shows up a particular channel number, but most all modern radios use an L.E.D. display, similar to an electronic calculator. Some radios have dispensed with the rotary control and use a pair of push-buttons to move up or down a channel at a time. This is a facility you could probably well do without, because the rate at which channels advance



A typical homebase

seldom suits any one person, and such radios sometimes revert to channel 1 or some other channel every time you switch them off. This can get to be a real nuisance if you have a favourite few channels and like to stick to them.

Microphone Push-to-Talk Switch.

The regulator microphone supplied with CB transceivers has a button or bar down one side. You press the switch in and hold it to switch to transmit and talk, and release it to listen again. Remember that CB is not quite the same as using a telephone. On a telephone both people can speak at the same time and be heard. It's no good trying to talk to someone on CB while they're talking to you – they won't hear you! With just a little practice you'll soon get the hang of pressing the button when you speak and releasing it afterwards.

Squelch Control. You'll find a squelch control on virtually all CB radios. It is intended to mute the background noise and hiss when no signal is present. There is always a certain amount of background noise, even on a completely free channel, and on FM systems (including the British system) you'll hear a fairly loud continuous hiss when no other signals are present. Turning the squelch control slowly up until this noise cuts out should eliminate it, causing the set to go silent when nobody is talking. The characteristic burst of noise you'll hear just after someone stops talking will soon become a good indication that it is your turn to speak. If you advance the squelch control further clockwise, you will gradually cut out weaker signals as well as noise. The higher you set the control, the stronger a signal must be before you will be able to hear it. At maximum you hear only very strong stations. The squelch control comes in handy for eliminating unwanted conversations from miles away, and for cutting out all distant stations when waiting for a call from a close-by station.

Signal Meter. The small meter found on most mobiles, almost all base stations, and sometimes on portable hand-held units serves a dual purpose. While you're listening to the set it shows the strength of the radio signal being received. The dial is usually calibrated from 0 to 9, then as +10, +20, and +30dB. The reasons for this seemingly strange numbering are technical and historical, and really of little importance. All you need to know is that the higher the needle goes, the stronger the radio signal is at your set. Someone just half a mile away may indicate 9 on the meter for example, whereas someone from eight or nine miles away may indicate 3 or 4. You shouldn't place too much

reliance on the meter for determining how far away someone is however, because the strength of a radio wave is affected by many things: the type of antenna used at each end, the location of the other station, surrounding objects, and so on. On transmit the meter usually shows your output power, thus indicating that your transmitter is working, although the reading is very approximate. Some of the latest sets use a line of small L.E.D. lights in place of a meter (it's cheaper!), but the principle is the same.

Tone Control. If provided, the tone control may be a rotary type, but is more often a two- or three-position switch. Just set it to the position that sounds best to you. Like the volume control, the tone switch only affects incoming signals, and will have no effect on your transmitted signal.

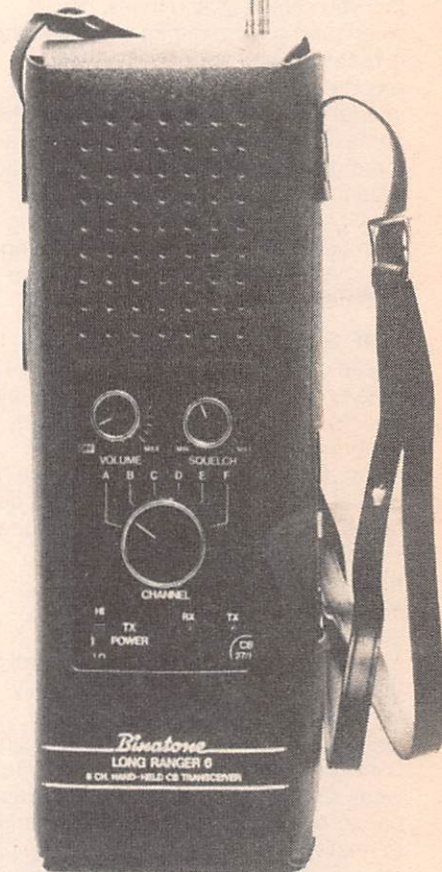
ANL or Noise Blanker. ANL stands for Automatic Noise Limiter, a device designed to reduce such interference as automobile ignition circuits. You'll find ANL fitted to AM radios only, because FM circuitry by the way it operates automatically limits such noise anyway. A noise blanker is often slightly more effective, and blanks out noise impulses rather than just trying to limit them in level. Noise blankers may be found on either AM or FM radios. Transceivers that don't have an ANL/NB switch on the front panel often have some noise limited built-in permanently, so check this in the specifications. Mobile installations, or base stations close to localised sources of interference such as busy main roads or factories will benefit from noise blankers most, but the quality of the blanking circuitry varies from adequate to almost non-existent.

PA Switch. This provides a Public Address facility, and is found on many mobile transceivers. The idea is to connect an external speaker on the roof of your car, or behind the front grill, switch to PA, and then use the microphone to broadcast advertising, control crowds, or whatever. The normal transmit and receive of your radio is temporarily disabled, so you won't be radiating your voice as a radio signal at the same time. Handy if you need it, but hardly an essential.

Channel 9 Switch. This doesn't add anything to your radio that isn't already there, but it provides a quick way to get to the emergency channel without turning the channel selector. To most people in any real emergency it would be just as quick to select channel 9 on the regular dial, so the switch is of little use.

Channel 9 Priority Switch. This is different to the above item! Some radios

A handy handheld



are capable of monitoring channel 9 at the same time you are listening to another channel. If a signal appears on the emergency channel the set immediately switches to it for you to hear any emergency call. Be careful of radios advertising channel 9 priority when all that is really meant is that the switch selects channel 9. Strangely, no British radios have yet appeared that support channel 9 priority switching.

Microphone Gain. Colloquially referred to as "mic gain". This is one of the few controls that will affect your transmitted signal. It is basically a volume control for your microphone, and will only rarely be turned back from maximum if you are talking to someone close-by who complains that you sound much louder than everyone else. A properly adjusted transmitter will never allow your voice to be so loud as to cause interference to other users, so unless you use a special microphone known as a "power mic" you'll have little need for this control.

High/Low Power Switch. This switch is usually only found on British radios designed to the 1981 specification, because the specifications required

them. High power is the 4-watts output that almost all CB radios provide, and low power is one tenth of that value. If you have a power attenuator such as this you should switch to low power when talking to someone close-by who is receiving you strongly. This will reduce or eliminate unnecessary interference to someone else using the same channel some distance away, and therefore helps ease channel congestion around cities and other areas of high activity. On a hand-held radio running from batteries, the lower power setting will considerably extend the life of the batteries.

RF Gain or DX/LOCAL Switch.

These control the sensitivity of your receiver, or how well it receives signals. Radios with a DX/LOCAL switch are generally used set at DX (a radio abbreviation meaning "long distance") so that the weakest signals can still be heard. If you have an extremely strong signal nearby it can overload your receiver and cause distortion, so switching to LOCAL to reduce the sensitivity of your receiver can sometimes help. The RF Gain control is the same thing, but with continuously variable gain rather than two fixed settings. You can also use an RF Gain control or switch to eliminate unwanted weak signals from far away, or to reduce background interference when listening to relatively strong signals. Most people never turn their gain controls down from maximum, which does not always give the best results.

AM/USB/LSB Switch. Found only on radios that incorporate Single Side Band (SSB) operation. This is a neat way of fitting two conversions into the space of one. A regular AM signal has two sidebands, upper and lower. Switching to SSB eliminates one of these, along with the signal called a *carrier* that is radiated as well. You can therefore have one conversation on, say, channel 35 Upper sideband, and another on channel 35 Lower sideband. You can't have someone using channel 35 AM as well, because the AM signal would interfere with both SSB signals, and vice versa. Some manufacturers claim 120 channels (40 AM, 40 USB, and 40 LSB), although the radio is still strictly speaking only 40 channel. The advantages of SSB are more conversations per chunk of radio spectrum, an improved range due to better efficiency, and a certain amount of privacy from people who only have AM from listening in. Disadvantages however are the increased cost of equipment, and the need to carefully fine tune a signal to be able to

understand it properly SSB is not allowed in Britain or most European countries.

Delta Tune or Clarifier. This is to the CB world what the fine tuner on a TV set is to television. American SSB radios will always have this rotary control, because SSB signals always require a certain amount of fine tuning to make the voice intelligible. The control should be slowly rotated until the voice comes in clear and at the right pitch. Modern AM and FM radios seldom require any such fine tuning, but some sets provide a control to allow good reception of anyone whose transmitter is a little off frequency. Some sets may have a three-position switch in place of a rotary control, thus offering a fixed amount of tuning either side of centre. Leave the switch at its middle position, or rotary control at midway for most contacts, and don't worry if your AM or FM radio doesn't have one!

Dimmer. Usually found only on radios intended for mobile use, the dimmer control is meant to reduce the brightness of the lights on the transceiver for night-time driving. One of the great mysteries of many CB radios is why the switch (or sometimes rotary control) often dims the channel readout but not the light for the signal meter, which is much more troublesome at night. Anyway, you probably won't miss having a dimmer control unless you drive a lot at night with the CB on and can't stand bright lights.

and are intended to be fixed in one of the same locations, under the dash being a favourite spot. These sets are designed to run from a standard 12-volt car electrical system, and have a separate microphone on a coiled cord. When looking for a mobile set bear a few points in mind. Firstly, make sure your intended set can be physically fixed in a suitable location – don't buy the radio and then discover it's an inch too long or too wide! Some mobile radios offer a vast array of controls on the front panel, but how many are actually necessary? If the radio is to be used while driving, then a bare minimum of controls is the safest bet; you don't have time to fiddle with six knobs and 28 buttons.

Base stations come in slightly larger boxes, and are intended to run straight from your regular wall outlet. They sometimes offer extra goodies, such as built-in clocks, and even a timer to switch the radio on or off at a given time. Many people prefer to use a mobile transceiver in conjunction with a 12-volt power supply, this being considerably less expensive than the purpose-built base units. The base stations are generally exactly the same circuitry inside as their equivalent mobile models, with the addition of a power supply, so you won't be losing anything by taking this approach in most cases. Some base units may offer better receiver circuitry than their mobile counterparts, so inquire about the particular models you have your eye on before parting with your hard-earned pay packet.



Types of radio

That then, has covered most of the controls you are likely to find on your average transceiver. Mobile radios look pretty much like your regular car radio,

Finally, hand-held units. These usually have the microphone built-in the case itself, and are small enough (just) to be held in one hand. They run on batteries, which they consume with a rather

Beginner's **L**uck

voracious appetite! Unlike mobile and base units, hand-helds sometimes offer less than the full complement of 40 channels. For point-to-point communication this is no big drawback, and two or three channels is ample. Most radios of this type allow you to change the preset channel numbers by buying and plugging-in different crystals, but do check before buying if the factory channels are not to your liking.

The other main variation is portable transceivers is the power output level. A few are designed to give the full level limit of 4 watts, but many operate at 2 watts, or even half a watt, to save battery power. If long range is essential to your use of a hand-held unit, go for one with the full output. If you continually use it on transmit however you'll find that the battery pack doesn't last too long, so the high-power hand-held radios are suited to occasional usage. Leaving the unit switched on in receive mode, with background noise eliminated by the squelch control is acceptable, because the radio uses very little power in this state.

Antennae

An antenna, or aerial, is an essential part of your CB installation. Many of the transceivers themselves vary only slightly in terms of quality of performance, but the antenna can make a whole world of difference. It is not only the antenna itself that affects overall operation, but also the way in which it is installed.

For mobile use you'll need to mount an antenna on your vehicle's bodywork somewhere. The basic antenna is a quarter-wave ground plane type. You needn't worry about what the technical terms actually mean, because the subject of antennae and wave radiation is extremely complicated, but at 27mHz a quarter-wave antenna is around 102 inches long. The mount at the bottom bolts through a hole on your roof or bumper, and the antenna proper is a "whip" made either of steel or copper wire embedded within fibreglass. The latter is actually a few inches shorter for a complex technical reason. It is unfortunate that for best performance the antenna should be mounted in the centre of your roof, because eight or nine feet of whip above your car is a little awkward. Mounting on a side fender reduces performance slightly (but not really by a noticeable amount), but is still difficult with a full-length whip in certain conditions. For that reason, antennae are made which are physically shorter, but constructed with a coil in them so that they are electrically still the same length. These are not quite so

efficient as a full-length whip, but are a reasonable compromise between size and performance. Such antennae may go down as low as 3ft, but you should avoid shorter types for 27mHz work, as they are extremely inefficient, and suitable only for very short range.

If you don't want to drill holes in your car's body, you can try a number of other options, none of which are quite as good however. A gutter clamp screws to one side gutter of your vehicle, and requires little installation. Magnetic mounts are designed to stick to the middle of your roof by way of a strong magnet in their base. These mounts are very handy for moving a transceiver between two or more vehicles, but they are not as good in performance as either gutter clamps or direct mounting. Once again, it is a case of meeting a compromise between performance, cost, and practicality.

As an alternative to using a separate antenna for your CB, you can buy a coupler device to enable you to use your existing car radio antenna. You can also buy couplers for using a single CB antenna for both CB and regular radio. You really should only consider these if it is *absolutely essential* that you avoid a second antenna, because performance is likely to suffer badly. At all costs avoid the cheap unbranded devices found in many shops.

Base station antennae can be made more efficiently, simply because they can generally be larger than mobile types and mounted higher. The general rule for base antennae is the higher the better – within reason of course. The largest base antennae are, by comparison to mobile types, monsters. Just about the best type is a 5/8-wave antenna. This runs in at around 22 feet upwards, with three or four radial pieces at 9 feet each extended from the bottom. Such an antenna mounted at 20 or 30 feet above ground, particularly on a good high part of the terrain in your immediate vicinity, gives good results.

The next antenna down (in size) is a half-wave type, at about 18 feet in length. Many half-wave antennae are extremely easy to install, consisting of four or five tubular sections that clamp together and a simple mounting bracket for a pole. Some types of half-wave antenna are centre-fed, and have a mounting bracket half way along their length. These are ideal for screwing to the side of a building, and consist of 9 feet of rod extending upward and 9 feet downward. Unfortunately all of these types of antenna are illegal for CB use in Britain, for reasons best known to the authorities (and even that's doubtful!)

The next type of antenna (how many

more?!) is a quarter-wave, just the same as those used on cars. Because the antenna needs something that will conduct electricity below the vertical rod, they are fitted with three or four ground plane radials at 90° to the vertical whip. These take the place of the metalwork of a vehicle. These quarter-wave antennae can be physically shortened in the same way as mobile types, and efficiently decreases in exactly the same way. British



(Above) Make life easy with an extension speaker

regulations only allow the use of such "loaded" antennae, i.e. those fitted with a coil and not exceeding a certain overall length. Many countries also have a height restriction on antennae, if not directly by way of radio regulations by way of building codes. As these vary from region to region you should check before planning a miniature Empire State Building in your back yard!

The final general category of base antenna we will mention is the "beam" type. These can be likened to a car headlight, and direct your signal in one direction rather than scattering it equally in a complete circle. They can therefore be used to improve your communication range in any given direction, but at the expense of greatly reduced range in all other directions. Beam antennae are commonly employed for fixed point-to-point communications over distances greater than those achieved with simple omni-directional antennae, and also help to reduce unwanted interference both to and from other users of the band. You can also buy an antenna rotator, which allows a beam to be quickly adjusted to any given direction. This scheme gives you the advantage of a beam antenna with the ability to direct your signal in any given direction. Many

Beginner's **L**uck

countries place limitations on the size and height of beam antennae, and Britain bans them altogether, which is a great pity in such a crowded island as ours.

Installation

Having chosen your transceiver and antenna you will want to get on with its installation. We'll first cover mobile set ups.

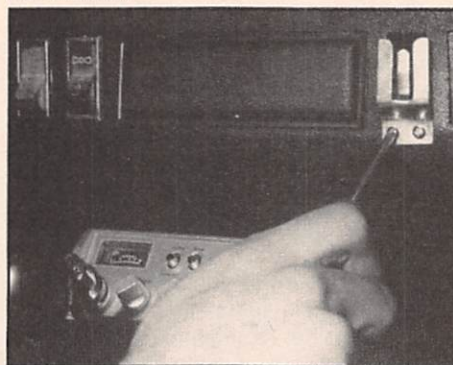
The mobile radio transceiver is fitted in the same way as many regular car radios. Common locations are under the dash or on a parcel shelf. You should ensure that all the controls be reached easily from the driver and/or passenger seat (depending on how the radio is to be used), and that the microphone cord will reach the required position without being stretched tight. At all costs make sure you securely fix the radio to the shelf or dashboard. This is important both for physical safety and for good performance. Make sure that the set itself, and none of its wiring (including the microphone!) can in any way interfere with the normal activities of driving.

Run the double power lead away from the back of the radio and locate a suitable power source. Virtually all cars made in the past 20 years are negative earth, but you should check if uncertain. Look at your battery connections and note whether the large bare strap to the chassis comes from the positive or negative battery terminal. If your positive terminal is connected to the chassis you have a positive-ground vehicle, which can cause problems. Many modern CB radios are designed to be fitted in either type of car, but some will only work with negative-earth types. If you have a positive-chassis car ask the dealer you purchase your equipment from whether it is suitable or not.

Before starting work on the electrical system of your car it is best to disconnect the battery by removing the "hot" side cable from the battery terminal (i.e. the wire that doesn't go to chassis - usually positive). Assuming a negative-chassis vehicle, you need to connect the negative (black) line from the radio to chassis. Any good solid bolt through the metalwork should suffice, but do make sure it really goes to the chassis of the car and not just some metal trimmings. Scrape the metal surrounding the bolt clean with a knife, and do use washers to clamp the wire down tight without cutting it.

Next you need a positive power terminal to feed the radio. This may be one that is live all the time, or feed through the "accessory" position of your ignition switch. Splice the red wire onto

this point using a screw-connector block or similar device. You should always retain the in-line fuse holder that is in your CB radio's power cord. That fuse protects both the set and the wiring from faults, damage, and possibly fire. If your power cord doesn't have a fuse in-line, either go back to your dealer and get one that does, or tap the wire onto a point that is already protected by a suitable fuse, such as your car radio supply. You should have no more than a 3-ampere fuse to protect the transceiver.



If your car is positive earth you should naturally connect the red wire to chassis and the black to the live power source, but you should also transfer the in-line fuse to the black wire. If you're not used to such fiddly operations it's best to have your dealer do it for you when you told him you had a positive-chassis vehicle. Leaving the fuse in the red wire in such installations is just as bad as having no fuse at all, so don't do it!

Next, the antenna. The best fixings demand a hole in your bodywork, which should be carefully scraped clean around its edge before fixing the mount. This is to ensure good electrical contact between the antenna mount and the car's chassis. The coaxial cable must then be routed back to your transceiver, avoiding any very tight bends that may crush the cable. If running the cable through the engine compartment try to avoid going near any ignition cables, as these can introduce interference.

If you have to drill holes in bulkheads it is best to fit them with a rubber grommet to stop the outer sheath of the cable fraying on the bare metal edge. With gutter mounts you should scrape the area of the rain gutter that the clamp's bolt will screw onto, again to ensure a good electrical contact. It is common practice to run the coaxial cable down the inside of the door frame, secured with thick parcel tape. You should be very careful if attempting this that the continual opening and closing of the door will not gradually wear the cable, or crush it. Use a back door if at

all possible, or the passenger door in preference to the driver's door.

Magnetic mounts are really best suited to temporary installations, and these too usually entail running the coaxial cable through a door jamb or window. Again be careful that the cable will not be crushed or otherwise damaged by the door or window.

Having routed the cable to the radio, and screwed, clipped, or otherwise attached the antenna whip to the mount, there is just one more stage before you are ready to use your installation: the antenna must be properly adjusted using a device called an SWR meter. It really isn't very difficult, and a great deal of mystique and nonsense has arisen over the years. Ignore the garbage you will hear on the air about SWR (Standing Wave Ratio), and just do the following. Buy, beg, or borrow an SWR meter with a patch cord (a short length of cable with a plug at each end). Using the patch cord connect the transceiver to the socket on the meter marked "Transceiver," "Radio," or something similar. Plug the antenna cable into the other socket (labelled "Aerial," "Ant." etc.). Switch on the radio and advance the volume control a little. With a bit of luck you will hear a few signals, but if not, turn your squelch control fully counterclockwise, and your RF gain (if any) to maximum or DX. Try a quick scan through the channels to see if you can receive anything. If so, you've probably done everything right so far, but if not won't worry!

Select channel 20 (or if someone close by is talking there try 18, 21 or 22), set the switch on the SWR meter to the position marked "Forward" or "Calibrate", and press the bar on the microphone to turn on your transmitter. As quickly as possible rotate the adjusting knob on the meter so that the needle indicated full-scale (usually marked "SET"). Set the switch to the "REF" or "SWR" position and note the reading on the meter before releasing the microphone button. If the meter stays up at the high end of scale (usually marked in red) you've probably done something wrong, so go back and check your installation carefully against the instructions provided with the antenna. If the needle dropped below the 2 on the SWR scale, you probably don't need to make any adjustments. Repeat the full test on channels 1 and 40, and note the SWR readings there. If they're both below 2, disconnect the meter, plug the antenna straight into the back of the radio, and away you go!

If your readings are above about 2, you need to make an adjustment to the length of your antenna. This is usually

achieved by a small sliding tip at the top of the whip, or by sliding the whole whip up and down in the coil at the bottom – your instructions and common sense should show you which. Move the whip up or down by about half an inch, then repeat the SWR readings. If the reading goes up you've moved the whip the wrong way, so readjust it in the opposite direction. If the reading goes down, keep moving the whip the same way until the SWR reading is as low as you can make it. Check the reading on channels 1 and 40, and if it is below 2 at both, you're finished. If you can get the reading down to 1.5 on all channels you've done well, and have a perfectly good installation. Throughout this adjustment procedure you should only switch the transmitter on (by pressing the microphone button) for a few seconds at a time until the reading is below the red portion of the meter's scale. If no amount of adjustment will get the reading down out of the red section, you've probably done something wrong. Some of the commonest problems are badly-wired coaxial plugs, and incorrectly-installed antenna mounts. Recheck everything and try again. Incidentally, the coaxial plugs used on CB equipment are very difficult to connect if you've never done it before, so it is best to have your dealer or other radio veteran wire them for you. The slightest strand of wire out of place can stop all that expensive equipment from working, and can even damage it, so beware.

Finally, make sure that all the wiring is neatly clipped out of harm's way where it cannot foul the steering column, gear shift, or pedals.

Base installation

All the comments in the preceeding section apply to base station installation. One important point regarding base antennae is that they are liable to be in extremely windy positions. For that reason any support mast should be securely fixed and guyed so that it will not come crashing down in the first 10mph breeze it encounters. Be sensible about your own limitations, and enlist some help in the form of several hefty marines to help hoist your antenna up. And for the ten-millionth (but not the last) time: *Stay away from ANY overhead cables!* Don't place your antenna or mast anywhere where it may come into contact with overhead cables, either during installation or in the event of it toppling in a storm.

The coaxial cable from the antenna (you did connect it before hoisting it 30 feet into the air, didn't you?) should be taped or otherwise clipped to the mast so that it will not flap around in the wind.

Make sure that the connection to the antenna is adequately weatherproofed, otherwise you'll find water seeping into the cable and literally rotting the copper away! It is generally a good idea to run it at least ten feet downwards before coming off at an angle to enter a bedroom window or shed. If you need to have the cable suspended over a reasonable distance, use a steel or strong nylon support cable. This will relieve strain that would otherwise gradually damage the cable. Run the cable into your home through a hole in a window frame, or other suitable location. You should leave a small loop of cable hanging down outside to prevent water running down the outside of the cable into your woodwork.

The adjustment of base antennae is pretty much the same as for mobile types, except that many base antennae are of a fixed length and cannot be adjusted. These types should still be checked with an SWR meter, and if you get a reading up in the red it probably means you've either put something together wrong on the antenna, or you've wired a plug badly. Base antennae that do require adjustment are usually set while just a few feet off the ground. The readings will change slightly when the whole unit is raised, but it should not be by a significant amount. If you are in a country that allows the use of beam antennae you will find the adjustment considerably more complicated, or it is very likely that you will require some assistance from a knowledgeable person.

In use

Your final use of CB radio is dictated by your requirements, so we will refrain from the usual explanation of CB slang, which is both irrelevant to personal/business users, and in declining use with many others. The following guidelines will help you get best results whatever your reasons for using CB.

When speaking, try to hold the microphone about 6in. from your mouth and speak in a normal voice. Avoid the tendency to either mumble or shout – neither help. Don't forget that only one person can talk to the other at a time; as long as you keep your PTT button on the microphone pressed in you won't be able to hear anyone else.

Respect the conventions of certain channels: the three to be careful of in Britain are channel 9, which is reserved for emergency use only, channel 19 which is used by many travellers on main roads, and channel 14 which is used as a calling channel in many areas. Some districts may have their

own peculiar calling channels, so ask a friendly local if you're not sure.

Don't use a channel if there is obviously someone else close-by using it. You'll only succeed in causing interference to each other, so move somewhere else. There is no priority service of who can have which channels, and the convention is simply that whoever is on a particular channel has the "right" to it until they move somewhere else or switch off. That said, it is extremely difficult to find free channels in some areas, so there must be some compromises. Two people from miles away can hold a conversation on the same channel as you if you're just talking to someone up the road, so if you all establish that nobody is causing any drastic interference to each other, just turn up your squelch to eliminate the distant conversation and carry on.

In conclusion

It is impossible to describe everything you may need to know in an article such as this, so our intention has been to give you a taste of what is in store for you. There is no substitute for the help of someone who has been using CB radio for a good many years, or a knowledgeable dealer. As with many things, if in doubt, ask.

Further reading (ask your local CB dealer:

The UK CB Handbook. Alan Ainslie.
CB Radio – Questions and Answers. Fred Judd.

CBe's Handy Manual of Base Stations. Edward L. Safford, Jr.

The Screwdriver Expert's Guide. Lou Franklin.



COMMUNICATION THE

QSL WAY



More names and addresses from QSLers all over the world, courtesy of David Shepherdson

Rather than run through all the details of forthcoming events this month, I want to cover some information on a few clubs and other topics and so I'll try to hit the high spots regarding events now, and refer you back to last month's copy for fuller details. Over the weekend of May 19th to 21st the Quebec Delta Sierra Group of Brechin are holding a sponsored modulation in aid of the Townhead Nursery Special School for Handicapped Children. Any help for this cause would of course be appreciated.

On Saturday May 20th there's the Tango Papa (83) Group's Charity Eyeball 1989 held at the Floral Hall, Southport. There's an admission charge and also a council charge for car parking. All proceeds to the Club's chosen charity.

On Sunday 21st May, the Southern Counties Eyeball is held at the Oakdene Holiday Village (off the A31). June 3rd is the date for the Sierra Tango Club's Eyeball being held at the Rhyl Football Ground from 10.30am. Over the weekend of 3rd and 4th of June, the Mercia QSL Club of Coventry are holding their Fifth Eyeball at the Sports Centre for the Disabled, Tile Hill, Coventry. All proceeds to go to the Sports Centre. It starts at 7pm (Sat) with a meal and entertainment, then on Sunday club and trade stalls, competitions, raffles, "Dutch Auctions" etc.

Over the weekend of 10th and 11th June the Sea Smugglers are holding their "do" at the Granville Hotel, Sea Road, Bexhill on Sea, admission 50p per day with Saturday night entertainments (£1). The following weekend (18th) the 1989 Sheffield Charity Gala and Eyeball is held at the British Steel Sports Ground

on Bawtry Road, Tinsley (near junction 34 on the M1).

Next is the Kilo Mike Eyeball (June 25th) at the Kirby Muxloe Sports Ground, Ratby Lane, Kirby Muxloe, Leicester. Into July with the 7th South Coast Eyeball held at the Portslade Community College, Mile Oak, between 10.30am and 5.30pm on July 16th. On the 30th July the Bravo Bravo (Beach Breakers) Group are holding their Beach Eyeball on Southport's beaches.

The Tripe City 3rd Eyeball is held at the Barton Village Hall, on the A6 near Preston on 19th August between 10am and 5pm. The North Wales Breakers 2nd Annual Charity Eyeball is to be held in the Bodolwyddan Community Centre and field, just off the A55 close to "Marble Church" over the weekend of 9th and 10th of September from 11am to

5pm. Over the same weekend, the Whisky Mikes are holding their annual eyeball at the GWR Sports Grounds, Valis Way, Ealing, London. September 17th and 18th are the dates of the Warwick Kingmakers' Social Evening and Eyeball held at the Warwick Race Course and, like the Whisky Mikes', overnight parking is available.

News in from the Solway Firth is that their Mega-Weekend runs from Friday 29th September through to Sunday 1st October, though it could very well spill over into Monday! The event is held, as usual at the Southerness Holiday Village and, again, all the caravans available for hire have been taken! At the time of writing there are still some places left as

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package was forced through my (thankfully) recently enlarged letterbox bearing stamps from the Isle of Man. Sorting through it, and I'm still doing that now, weeks after it came, I found that it was from what must be the most active and prolific QSLer on the island. This is Len (Len the Zen, or just "Zen"). He has sent me details on all the IoM clubs, tourist information on the island and umpteen leaflets and informative sheets. Many thanks Len.

I then received a package from the Royal Ramsey Club. The following info on the IoM clubs is taken from the two packages I've received, with my thanks. The most active club is obviously the Royal Ramsey to which (UK mainland) membership costs £5 for which you get your membership number, ID card, 10 club cards, roster, info package about the IoM, and extras as available which

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WELSH VALLEY



CYMRU
D.X. CLUB

far as spaces for touring caravans and tents go. Contact the club at the usual PO Box for full details.

Indeed, for fuller details on any of the events given above please contact the club concerned enclosing return postage for their reply.

Right, a round up of some clubs which have dropped me brief notes asking for a mention here. Unfortunately, none of these clubs have actually sent me any details on the cost of joining, so anyone interested will have to get in touch with the club or clubs concerned. The first is the Cookstown CB Club of County Tyrone which was formed in 1982 and has around 40 members at the time of writing. The Club help various charities including their local handicapped club.

Another one in Northern Ireland is the Whiskey Charlie DX Group. Again, no details on the Club, just a card and a request for anyone interested to get in touch. A club down in London has asked for a mention and that is the Aeronauts of the airwaves. Barry (*The Chairman*) also asked for the current address of the UK International Radio Group. I'll include the latest one I have in the club's AD slot for you.

The final Club for just now is the Welsh Valley DX Club which is currently putting a QSL/members package together and wishes to invite breakers from all over the world to join. For details, costs and just what you get, you'll have to drop Colin (Club Secretary) a line at the PO Box address.

Now, several months ago I said that if any QSLers or QSL clubs on the Isle of Man cared to get in touch, I'd do my best to include an "Island Special". I've since had a letter from John (*Quadman*) saying how surprised he was that I later complained about the lack of any contact as he knew of two clubs there. About the same time I received my first contact from the island! This made up for the long wait I had been experiencing. An absolutely massive

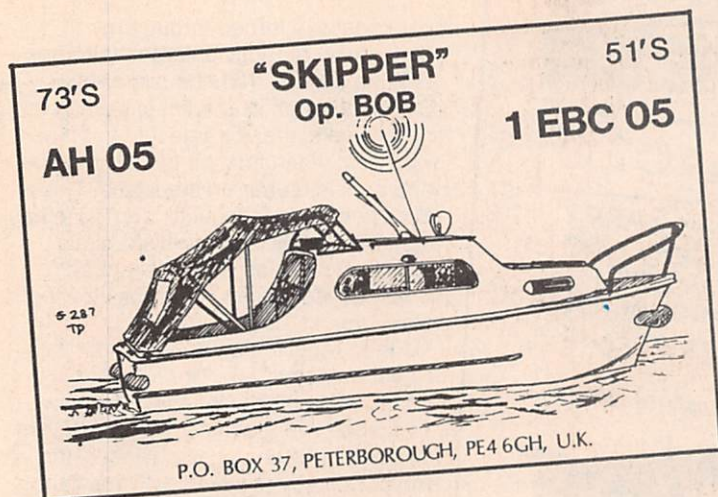


ZEN
sierra bravo 077

EV 077
MB 077
VR 070
TMD077



Len, P.O.Box 77, Douglas, Isle of Man.



could include such things as stickers, key fobs etc. A club stamp is also available at £2.50 extra. For IoM members and, I'm sure, for visiting members, the Club has a very active social calendar with treasure hunts, indoor target-shooting, bowling, slide shows and a summer barbecue. During the winter months the Club and the Douglas Club have an on-going Sports Challenge for a shield. The Club also takes part in sponsored fund-raising events. Other clubs on the island, though unfortunately I have received no information directly from them, include the following: The Mike Bravo Social Club of Douglas, South Side Breakers of Castletown and the Isle of Man CB Club of Douglas. If you are interested in joining any of these clubs, do drop them a line and ask. Please remember return postage and wait and see what comes back.

By the time you read this, we will be well into the season of Eyeballs and I hope I will have seen some of you at one or two of them "up North" and hopefully by next month I'll be able to run through a few of the names, cards and addresses I picked up while out and about. Already this year I've been to the Eyeball at Stanley, Co Durham, around about now I'll be at Southport and in a couple of weeks down at Kirby Muxloe in Leicester. So for now, a few more names and handles, cards etc, then I'm going to get ready to go to the next Eyeball!

First up, a tremendous bundle from Adrian (*Hunter*) of the India Tango Club in Ipswich. Adrian also asks me to pass on his thanks to *Private Eye*, *Puzzle Lady* and Norman for all their hard work. A pile of Currie Cards in from Tom (*Marathon Man 2*) of the Sierra Lima Club in Aldershot. A superb "hot-foil" card by Sharp Graphics in from Bob (*Skipper*) who asks for a mention but also stresses that he QSLs only on QSO (radio contact). He also asks if I could mention the service that Sharp Graphics gave him when he recently re-ordered his card. He posted his order to them, they contacted him with a suggested improvement and printed and delivered

QSLer Addresses:

Len (<i>Len the Zen</i>)	PO Box 77, Douglas, Isle of Man
Adrian (<i>Hunter</i>)	PO Box 30, Ipswich
<i>Puzzle Lady</i> , <i>Private Eye</i>	PO Box 30, Ipswich
Tom (<i>Marathon Man 2</i>)	PO Box 55, Aldershot, Hants GU11 7YX
Box (<i>Skipper</i>)	PO Box 37, Peterborough PE4 6GH
John (<i>Quadman</i>)	20 Causeway Road, Seaton, Workington, Cumbria CA14 1PJ

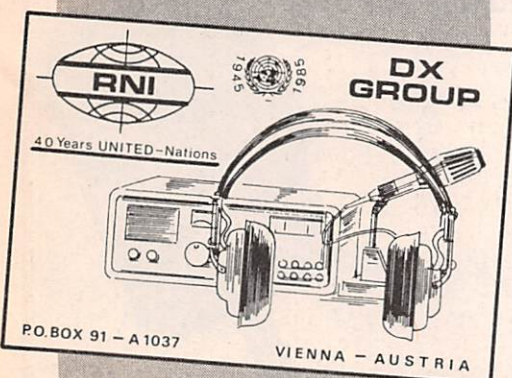
QSL Club Addresses:

Aeronauts of the Airwaves	PO Box 525, London N20 0UN
Cookstown CB Club	PO Box 59, Cookstown, Co. Tyrone, Northern Ireland BT80 8ZT
Isle of Man CB Club	PO Box 77, Douglas, Isle of Man
Kilo Mike DX Group	PO Box 1, Kirby Muxloe, Leicester
Mercia QSL Club	PO Box 158, Coventry CV6 6BD
Mike Bravo Social	PO Box 98, Douglas, Isle of Man
Mile Oak/South Coast Eyeball	83 Oakdene Cres, Portslade, Sussex
North Wales Breakers	PO Box 35, Prestatyn, Clwyd LL19 9YH
Quebec Delta Sierra Group	PO Box 3, Brechin, Scotland
Radio North Sea Int'	PO Box 91, A-1037 Vienna, Austria
Royal Ramsey DX Club	PO Box 39, Ramsey, Isle of Man
Sea Anglers	PO Box 139, Bexhill on Sea, E Sussex TN40 2AF
Sheffield Charith Eyeball	PO Box 275, Sheffield S2 5HY
Sierra Lima DX Group	PO Box 55, Aldershot, Hants GY11 7YX
Sierra Tango	PO Box 8, Rhyl, Clwyd
Solway Pirates	PO Box 15, Kirkcudbright, Scotland
South Side Breakers	PO Box 8, Castletown, Isle of Man
Southern Counties Eyeball	PO Box 27, Romsey, Hants
Tango Papa (83) Group	PO Box 13, Southport
Tripe City Breakers	PO Box 14, Accrington, Lancs
UK Int' radio Group	PO Box 17, Barnstaple, Devon EX32 8DR
Warwick Kingmakers	PO Box 10-5, Warwick CV34 5GX
Welsh Valley DX Club	PO Box 2, Treharris, South Wales CF46 5YA
Whiskey Charlie DX Group	PO Box 14, Armagh, Northern Ireland
Whiskey Mike DX Group	PO Box 23, Brentford, Middx TW8 9NF

When writing to any QSL club or firm, always include return postage to assist with their reply, it does help. Please also mention that you saw their name in the CB Mag, thanks.

his cards within 14 days regardless!

I think that I can just squeeze in a quick browse so, for a change, this month's Browse Through a Club's Package concentrates on a club from outside the UK. I would hate to say just when this was given to me but it's been a while! Apologies to John (RNI 002) for the delay. Cost of membership to the Radio Northsea International DX Group is 10 of your own personal QSL cards, each signed and dated along with 10 IRCs (International Reply Coupons) which are available from your local post office. For this you should expect your RNI unit number and certificate, 25 mixed clubs QSL cards, a colour viewcard of Vienna, and Austria tourist info. Also, you get something called a "Hias" which I believe translates to a "Nice doll for your collection". This was missing from the review package and was supposed to be sent on later, but probably due to the delay in fitting this review in, hasn't yet come! In addition to the above, the package also included a pen and box of matches with a club sticker on each. There is also a number of stickers of Austria as well as the club. There were also a number of exchange invites for other clubs, a DX certificate and an envelope made out to the club for you to contact them.



Well, once again that's it, no more room, so I'll close with a reminder that if you want a mention, either for yourself, or for your club, please drop me a line. For yourself, don't send a bit of paper asking for a mention, send me your usual QSL package which will give you a far better chance of a mention. For a club, please let me have some details of the club and PLEASE do include an up-to-date membership application form so I can see what you offer and for how much. If you have a query which I might be able to help with, or you require a reply, please do remember to include suitable return postage and whatever you do, please send it to 3 Tarn Villas, Cowpasture Road, Ilkley, West Yorkshire LS29 8RH and not via the magazine.

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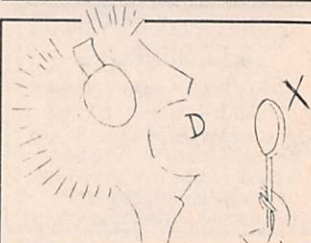
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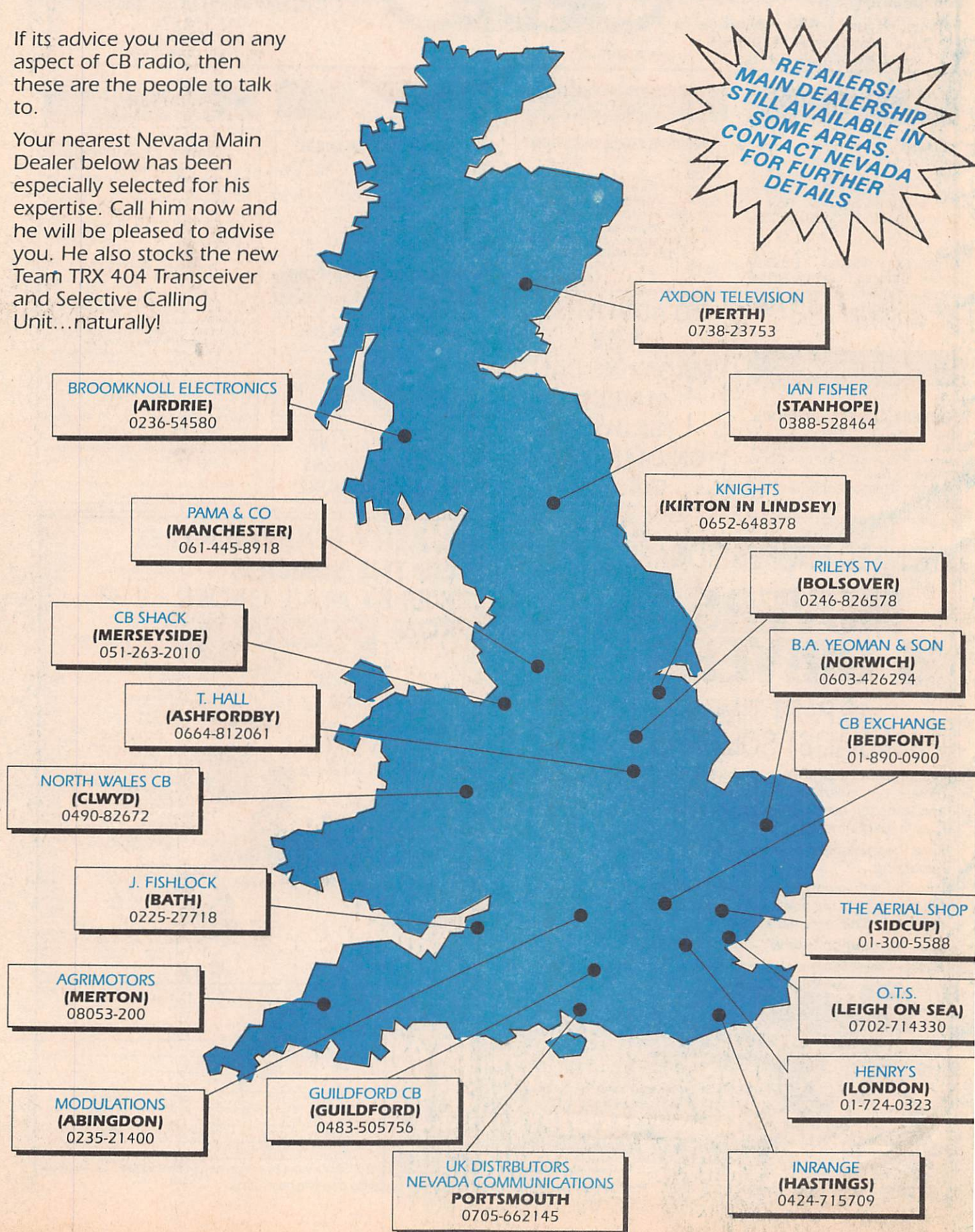
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